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For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 08/05/2004 - #006

PRODUCT NAME: ACETONE  
MSDS NUMBER: MZA0446  
DATE ISSUED: 8/4/2004  
SUPERSEDES: 3/2/2004  
ISSUED BY: 008614

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ACETONE

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#### 1. PRODUCT IDENTIFICATION

SYNONYMS: DIMETHYLKETONE; 2-PROPANONE; DIMETHYLKETAL  
CAS NO: 67-64-1  
MOLECULAR WEIGHT: 58.08  
CHEMICAL FORMULA: (CH<sub>3</sub>)<sub>2</sub>CO

Distributed by:  
Univar USA Inc.  
6100 Carillon Point  
Kirkland, WA 98033  
425-889-3400

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#### 2. COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENT | CAS NO  | PERCENT   | HAZARDOUS |
|------------|---------|-----------|-----------|
| ACETONE    | 67-64-1 | 99 - 100% | YES       |

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#### 3. HAZARDS IDENTIFICATION

##### EMERGENCY OVERVIEW

|                   |              |           |              |
|-------------------|--------------|-----------|--------------|
| Post-it® Fax Note | 7671         | Date 7/11 | # of pages 7 |
| To Mary           | From Cynthia |           |              |
| Co./Dept.         | Co. UNIVAR   |           |              |

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DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE.  
HARMFUL IF SWALLOWED OR INHALED. CAUSES IRRITATION TO SKIN, EYES AND  
RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

POTENTIAL HEALTH EFFECTS  
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## INHALATION:

INHALATION OF VAPORS IRRITATES THE RESPIRATORY TRACT. MAY CAUSE COUGHING,  
DIZZINESS, DULLNESS, AND HEADACHE. HIGHER CONCENTRATIONS CAN PRODUCE  
CENTRAL NERVOUS SYSTEM DEPRESSION, NARCOSIS, AND UNCONSCIOUSNESS.

## INGESTION:

SWALLOWING SMALL AMOUNTS IS NOT LIKELY TO PRODUCE HARMFUL EFFECTS.  
INGESTION OF LARGER AMOUNTS MAY PRODUCE ABDOMINAL PAIN, NAUSEA AND  
VOMITING. ASPIRATION INTO LUNGS CAN PRODUCE SEVERE LUNG DAMAGE AND IS A  
MEDICAL EMERGENCY. OTHER SYMPTOMS ARE EXPECTED TO PARALLEL INHALATION.

## SKIN CONTACT:

IRRITATING DUE TO DEFATTING ACTION ON SKIN. CAUSES REDNESS, PAIN, DRYING  
AND CRACKING OF THE SKIN.

## EYE CONTACT:

VAPORS ARE IRRITATING TO THE EYES. SPLASHES MAY CAUSE SEVERE IRRITATION,  
WITH STINGING, TEARING, REDNESS AND PAIN.

## CHRONIC EXPOSURE:

PROLONGED OR REPEATED SKIN CONTACT MAY PRODUCE SEVERE IRRITATION OR  
DERMATITIS.

## AGGRAVATION OF PRE-EXISTING CONDITIONS:

USE OF ALCOHOLIC BEVERAGES ENHANCES TOXIC EFFECTS. EXPOSURE MAY INCREASE  
THE TOXIC POTENTIAL OF CHLORINATED HYDROCARBONS, SUCH AS CHLOROFORM,  
TRICHLOROETHANE.

## =====

## 4. FIRST AID MEASURES

## INHALATION:

REMOVE TO FRESH AIR. IF NOT BREATHING, GIVE ARTIFICIAL RESPIRATION. IF  
BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION.

## INGESTION:

ASPIRATION HAZARD. IF SWALLOWED, VOMITING MAY OCCUR SPONTANEOUSLY, BUT DO  
NOT INDUCE. IF VOMITING OCCURS, KEEP HEAD BELOW HIPS TO PREVENT ASPIRATION  
INTO LUNGS. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. CALL A  
PHYSICIAN IMMEDIATELY.

## SKIN CONTACT:

IMMEDIATELY FLUSH SKIN WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES. REMOVE  
CONTAMINATED CLOTHING AND SHOES. GET MEDICAL ATTENTION. WASH CLOTHING  
BEFORE REUSE. THOROUGHLY CLEAN SHOES BEFORE REUSE.

## EYE CONTACT:

IMMEDIATELY FLUSH EYES WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES,  
LIFTING UPPER AND LOWER EYELIDS OCCASIONALLY. GET MEDICAL ATTENTION.

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## 5. FIRE FIGHTING MEASURES

## FIRE:

FLASH POINT: -20C (-4F) CC

AUTOIGNITION TEMPERATURE: 465C (869F)

FLAMMABLE LIMITS IN AIR % BY VOLUME:

LEL: 2.5; UEL: 12.8

EXTREMELY FLAMMABLE LIQUID AND VAPOR! VAPOR MAY CAUSE FLASH FIRE.

## EXPLOSION:

ABOVE FLASH POINT, VAPOR-AIR MIXTURES ARE EXPLOSIVE WITHIN FLAMMABLE LIMITS NOTED ABOVE. VAPORS CAN FLOW ALONG SURFACES TO DISTANT IGNITION SOURCE AND FLASH BACK. CONTACT WITH STRONG OXIDIZERS MAY CAUSE FIRE. SEALED CONTAINERS MAY RUPTURE WHEN HEATED. THIS MATERIAL MAY PRODUCE A FLOATING FIRE HAZARD. SENSITIVE TO STATIC DISCHARGE.

## FIRE EXTINGUISHING MEDIA:

DRY CHEMICAL, ALCOHOL FOAM OR CARBON DIOXIDE. WATER MAY BE INEFFECTIVE. WATER SPRAY MAY BE USED TO KEEP FIRE EXPOSED CONTAINERS COOL, DILUTE SPILLS TO NONFLAMMABLE MIXTURES, PROTECT PERSONNEL ATTEMPTING TO STOP LEAK AND DISPERSE VAPORS.

## SPECIAL INFORMATION:

IN THE EVENT OF A FIRE, WEAR FULL PROTECTIVE CLOTHING AND NIOSH-APPROVED SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN THE PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

## 6. ACCIDENTAL RELEASE MEASURES

VENTILATE AREA OF LEAK OR SPILL. REMOVE ALL SOURCES OF IGNITION. WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT AS SPECIFIED IN SECTION 8. ISOLATE HAZARD AREA. KEEP UNNECESSARY AND UNPROTECTED PERSONNEL FROM ENTERING. CONTAIN AND RECOVER LIQUID WHEN POSSIBLE. USE NON-SPARKING TOOLS AND EQUIPMENT. COLLECT LIQUID IN AN APPROPRIATE CONTAINER OR ABSORB WITH AN INERT MATERIAL (E. G., VERMICULITE, DRY SAND, EARTH), AND PLACE IN A CHEMICAL WASTE CONTAINER. DO NOT USE COMBUSTIBLE MATERIALS, SUCH AS SAW DUST. DO NOT FLUSH TO SEWER! IF A LEAK OR SPILL HAS NOT IGNITED, USE WATER SPRAY TO DISPERSE THE VAPORS, TO PROTECT PERSONNEL ATTEMPTING TO STOP LEAK, AND TO FLUSH SPILLS AWAY FROM EXPOSURES. US REGULATIONS (CERCLA) REQUIRE REPORTING SPILLS AND RELEASES TO SOIL, WATER AND AIR IN EXCESS OF REPORTABLE QUANTITIES. THE TOLL FREE NUMBER FOR THE US COAST GUARD NATIONAL RESPONSE CENTER IS (800) 424-8802.

## 7. HANDLING AND STORAGE

PROTECT AGAINST PHYSICAL DAMAGE. STORE IN A COOL, DRY WELL-VENTILATED LOCATION, AWAY FROM ANY AREA WHERE THE FIRE HAZARD MAY BE ACUTE. OUTSIDE OR DETACHED STORAGE IS PREFERRED. SEPARATE FROM INCOMPATIBLES. CONTAINERS SHOULD BE BONDED AND GROUNDED FOR TRANSFERS TO AVOID STATIC SPARKS. STORAGE AND USE AREAS SHOULD BE NO SMOKING AREAS. USE NON-SPARKING TYPE TOOLS AND EQUIPMENT, INCLUDING EXPLOSION PROOF VENTILATION. CONTAINERS OF THIS MATERIAL MAY BE HAZARDOUS WHEN EMPTY SINCE THEY RETAIN PRODUCT RESIDUES (VAPORS, LIQUID); OBSERVE ALL WARNINGS AND PRECAUTIONS LISTED FOR THE PRODUCT.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

## AIRBORNE EXPOSURE LIMITS:

## ACETONE:

-OSHA PERMISSIBLE EXPOSURE LIMIT (PEL):  
1000 PPM (TWA)

## -ACGIH THRESHOLD LIMIT VALUE (TLV):

500 PPM (TWA), 750 PPM (STEL) A4 - NOT CLASSIFIABLE AS A HUMAN CARCINOGEN

## VENTILATION SYSTEM:

A SYSTEM OF LOCAL AND/OR GENERAL EXHAUST IS RECOMMENDED TO KEEP EMPLOYEE EXPOSURES BELOW THE AIRBORNE EXPOSURE LIMITS. LOCAL EXHAUST VENTILATION IS GENERALLY PREFERRED BECAUSE IT CAN CONTROL THE EMISSIONS OF THE CONTAMINANT AT ITS SOURCE, PREVENTING DISPERSION OF IT INTO THE GENERAL WORK AREA. PLEASE REFER TO THE ACGIH DOCUMENT, "INDUSTRIAL VENTILATION, A MANUAL OF RECOMMENDED PRACTICES", MOST RECENT EDITION, FOR DETAILS.

## PERSONAL RESPIRATORS (NIOSH APPROVED):

IF THE EXPOSURE LIMIT IS EXCEEDED AND ENGINEERING CONTROLS ARE NOT FEASIBLE, A HALF-FACE ORGANIC VAPOR RESPIRATOR MAY BE WORN FOR UP TO TEN TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. A FULL-FACE PIECE ORGANIC VAPOR RESPIRATOR MAY BE WORN UP TO 50 TIMES THE EXPOSURE LIMIT, OR THE MAXIMUM USE CONCENTRATION SPECIFIED BY THE APPROPRIATE REGULATORY AGENCY OR RESPIRATOR SUPPLIER, WHICHEVER IS LOWEST. FOR EMERGENCIES OR INSTANCES WHERE THE EXPOSURE LEVELS ARE NOT KNOWN, USE A FULL-FACE PIECE POSITIVE-PRESSURE, AIR-SUPPLIED RESPIRATOR. WARNING: AIR-PURIFYING RESPIRATORS DO NOT PROTECT WORKERS IN OXYGEN-DEFICIENT ATMOSPHERES.

## SKIN PROTECTION:

WEAR IMPERVIOUS PROTECTIVE CLOTHING, INCLUDING BOOTS, GLOVES, LAB COAT, APRON OR COVERALLS, AS APPROPRIATE, TO PREVENT SKIN CONTACT.

## EYE PROTECTION:

USE CHEMICAL SAFETY GOGGLES AND/OR A FULL FACE SHIELD WHERE SPLASHING IS POSSIBLE. MAINTAIN EYE WASH FOUNTAIN AND QUICK-DRENCH FACILITIES IN WORK AREA.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

## APPEARANCE:

CLEAR, COLORLESS, VOLATILE LIQUID.

## BOILING POINT:

56.5C (133F) @ 760 MM HG

## ODOR:

FRAGRANT, MINT-LIKE

## MELTING POINT:

-95C (-139F)

## SOLUBILITY:

MISCIBLE IN ALL PROPORTIONS IN WATER.

## VAPOR DENSITY (AIR=1):

2.0

## SPECIFIC GRAVITY:

0.79 @ 20C/4C

## VAPOR PRESSURE (MM HG):

400 @ 39.5C (104F)

## PH:

NO INFORMATION FOUND.

## EVAPORATION RATE (BUAC=1):

CA. 7.7

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% VOLATILES BY VOLUME @ 21C (70F):  
100

## 10. STABILITY AND REACTIVITY

STABILITY:  
STABLE UNDER ORDINARY CONDITIONS OF USE AND STORAGE.

HAZARDOUS DECOMPOSITION PRODUCTS:  
CARBON DIOXIDE AND CARBON MONOXIDE MAY FORM WHEN HEATED TO DECOMPOSITION.

HAZARDOUS POLYMERIZATION:  
WILL NOT OCCUR.

INCOMPATIBILITIES:  
CONCENTRATED NITRIC AND SULFURIC ACID MIXTURES, OXIDIZING MATERIALS,  
CHLOROFORM, ALKALIS, CHLORINE COMPOUNDS, ACIDS, POTASSIUM T-BUTOXIDE.

CONDITIONS TO AVOID:  
HEAT, FLAMES, IGNITION SOURCES AND INCOMPATIBLES.

## 11. TOXICOLOGICAL INFORMATION

ORAL RAT LD50: 5800 MG/KG; INHALATION RAT LC50: 50,100MG/M3; IRRITATION EYE  
RABBIT, STANDARD DRAIZE, 20 MG SEVERE; INVESTIGATED AS A TUMORIGEN,  
MUTAGEN, REPRODUCTIVE EFFECTOR.

-----/CANCER LISTS/-----  
-----NTP CARCINOGEN-----  
INGREDIENT                      KNOWN              ANTICIPATED              IARC CATEGOR  
-----  
ACETONE (67-64-1)                      NO                      NO                      NONE

## 12. ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE:  
WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO READILY  
BIODEGRADE. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO LEACH  
INTO GROUNDWATER. WHEN RELEASED INTO THE SOIL, THIS MATERIAL IS EXPECTED TO  
QUICKLY EVAPORATE. WHEN RELEASED INTO WATER, THIS MATERIAL IS EXPECTED TO  
READILY BIODEGRADE. WHEN RELEASED TO WATER, THIS MATERIAL IS EXPECTED TO  
QUICKLY EVAPORATE. THIS MATERIAL HAS A LOG OCTANOL-WATER PARTITION  
COEFFICIENT OF LESS THAN 3.0. THIS MATERIAL IS NOT EXPECTED TO  
SIGNIFICANTLY BIOACCUMULATE. WHEN RELEASED INTO THE AIR, THIS MATERIAL MAY  
BE MODERATELY DEGRADED BY REACTION WITH PHOTOCHEMICALLY PRODUCED HYDROXYL  
RADICALS. WHEN RELEASED INTO THE AIR, THIS MATERIAL MAY BE MODERATELY  
DEGRADED BY PHOTOLYSIS. WHEN RELEASED INTO THE AIR, THIS MATERIAL IS  
EXPECTED TO BE READILY REMOVED FROM THE ATMOSPHERE BY WET DEPOSITION.

ENVIRONMENTAL TOXICITY:  
THIS MATERIAL IS NOT EXPECTED TO BE TOXIC TO AQUATIC LIFE. THE LC50/96-HOUR  
VALUES FOR FISH ARE OVER 100 MG/L.

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## 13. DISPOSAL CONSIDERATIONS

WHATEVER CANNOT BE SAVED FOR RECOVERY OR RECYCLING SHOULD BE HANDLED AS HAZARDOUS WASTE AND SENT TO A RCRA APPROVED INCINERATOR OR DISPOSED IN A RCRA APPROVED WASTE FACILITY. PROCESSING, USE OR CONTAMINATION OF THIS PRODUCT MAY CHANGE THE WASTE MANAGEMENT OPTIONS. STATE AND LOCAL DISPOSAL REGULATIONS MAY DIFFER FROM FEDERAL DISPOSAL REGULATIONS.

DISPOSE OF CONTAINER AND UNUSED CONTENTS IN ACCORDANCE WITH FEDERAL, STATE AND LOCAL REQUIREMENTS.

## =====

## 14. TRANSPORT INFORMATION

## DOMESTIC (LAND, D.O.T.)

PROPER SHIPPING NAME: ACETONE  
HAZARD CLASS: 3  
UN/NA: UN1090

PACKING GROUP: II

## INTERNATIONAL (WATER, I.M.O.)

PROPER SHIPPING NAME: ACETONE  
HAZARD CLASS: 3  
UN/NA: UN1090

PACKING GROUP: II

## =====

## 15. REGULATORY INFORMATION

-----/CHEMICAL INVENTORY STATUS - PART 1/-----  
INGREDIENT TSCA EC JAPAN AUSTRALIA  
-----  
ACETONE (67-64-1) YES YES YES YES

-----/CHEMICAL INVENTORY STATUS - PART 2/-----  
INGREDIENT KOREA DSL --CANADA-- NDSL PHIL.  
-----  
ACETONE (67-64-1) YES YES NO YES

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 1/-----  
INGREDIENT -SARA 302- -SARA 313-  
RQ TPQ LIST CHEMICAL CATG  
-----  
ACETONE (67-64-1) NO NO YES NO

-----/FEDERAL, STATE & INTERNATIONAL REGULATIONS - PART 2/-----  
-RCRA- -TSCA-  
INGREDIENT CERCLA 261.33 8(D)  
-----  
ACETONE (67-64-1) 5000 U002 NO

CHEMICAL WEAPONS CONVENTION: NO TSCA 12(B): YES CDTA: YES  
SARA 311/312: ACUTE: YES CHRONIC: NO FIRE: YES PRESSURE: NO  
REACTIVITY: NO (PURE / LIQUID)

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AUSTRALIAN HAZCHEM CODE: 2(Y)E  
POISON SCHEDULE: NONE ALLOCATED.

WHMIS: THIS MSDS HAS BEEN PREPARED ACCORDING TO THE HAZARD CRITERIA OF  
THE CONTROLLED PRODUCTS REGULATIONS (CPR) AND THE MSDS CONTAINS  
ALL OF THE INFORMATION REQUIRED BY THE CPR.

## =====

## 16. OTHER INFORMATION

## NFPA RATINGS:

HEALTH: 1 FLAMMABILITY: 3 REACTIVITY: 0

## For Additional Information:

Contact: MSDS Coordinator - Univar USA

During business hours, Pacific Time - (425) 889-3400

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END OF MSDS

**UNIVAR**

Univar USA Inc.  
17425 NE Union Hill Road  
Redmond, WA 98052  
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

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The Version Date and Number for this MSDS is : 08/03/2004 - #001

\*\*\*\*\*  
PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: METHANOL  
MSDS#: EZ64835  
DATE ISSUED: 09/30/2003  
SUPERSEDES: NEW  
ISSUED BY: 009292  
MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name Methanol

Distributed by:  
Univar USA Inc.  
6100 Carillon Point  
Kirkland, WA 98033  
425-889-3400

|                   |           |
|-------------------|-----------|
| Chemical Name     | methanol  |
| Synonym(s)        | 982893    |
| Molecular Formula | CH4O      |
| Molecular Weight  | 32.04     |
| Product Use       | solvent   |
| OSHA Status       | hazardous |

For emergency transportation information, call CHEMTREC at 800-424-9300

2. COMPOSITION INFORMATION ON INGREDIENTS

(Typical composition is given, and it may vary. A certificate of analysis can be provided, if available.)

| Weight % | Component | CAS Registry No |
|----------|-----------|-----------------|
|----------|-----------|-----------------|

|                   |       |           |              |
|-------------------|-------|-----------|--------------|
| Post-it* Fax Note | 7671  | Date 7/11 | # of pages 7 |
| To                | MAKUP | From      | Unitha       |
| Co./Dept.         |       | Co.       | UNIVAR       |

<http://commerce.univarusa.com/commerce/Uic?ai>

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100%            methanol            67-56-1

### 3. HAZARDS IDENTIFICATION

**DANGER!****FLAMMABLE LIQUID AND VAPOR****MAY BE FATAL OR CAUSE BLINDNESS IF SWALLOWED****CANNOT BE MADE NONPOISONOUS - VAPOR HARMFUL****HARMFUL IF ABSORBED THROUGH SKIN**

HMIS(R) Hazard Ratings: Health - 2\*, Flammability -3, Chemical Reactivity - 0

HMIS(R) rating involves data interpretations that may vary from company to company. They are intended only for rapid, general identification of the magnitude of the specific hazard. To deal adequately with the safe handling of this material, all the information contained in this MSDS must be considered.

### 4. FIRST-AID MEASURES

**Inhalation:**

Move to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician or poison control center immediately.

**Eyes:**

Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention.

**Skin:**

Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Call a physician or poison control center immediately. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.

**Ingestion:**

Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person.

Note to Physicians: Symptoms of poisoning may not appear for several hours. Keep under medical supervision for at least 48 hours.

### 5. FIRE FIGHTING MEASURES

**Extinguishing Media:**

Water spray, dry chemical, carbon dioxide, alcohol foam

**Special Fire-Fighting Procedures:**

Wear self-contained breathing apparatus and protective clothing.

Use water spray to keep fire-exposed containers cool. Water may be ineffective in fighting the fire.

**Hazardous Combustion Products:**

Carbon dioxide, carbon monoxide

**Unusual Fire and Explosion Hazards:**

Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Prevent buildup of vapors or gases to explosive concentrations.



**Sensitivity to Static Discharge:**

Material is unlikely to accumulate a static charge which could act as an ignition source.

**6. ACCIDENTAL RELEASE MEASURES**

Wear appropriate personal protective equipment. Eliminate all ignition sources. Absorb spill with vermiculite or other inert material, then place in a container for chemical waste.

**For Large Spills:**

Use water spray to disperse vapors and dilute spill to a nonflammable mixture.

Prevent runoff from entering drains, sewers, or streams.

**7. HANDLING AND STORAGE****Personal Precautionary Measures:**

Avoid breathing mist or vapor. Avoid contact with eyes, skin, and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling.

**Prevention of Fire and Explosion:**

Keep away from heat, sparks, and flame. Keep from contact with oxidizing materials. Use only with adequate ventilation. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

**Storage:**

Keep container tightly closed and in a well-ventilated place.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Country specific exposure limits have not been established or are not applicable unless listed below.

**METHANOL**

US. ACGIH Threshold Limit Values

Time Weighted Average (TWA): 200 ppm,

US. ACGIH Threshold Limit Values

Short Term Exposure Limit (STEL): 250 ppm,

US. ACGIH Threshold Limit Values

Skin designation: Can be absorbed through the skin.

**METHYL ALCOHOL**

US. NIOSH: Pocket Guide to Chemical Hazards

Recommended exposure limit (REL): 200 ppm, 260 mg/m<sup>3</sup>

US. NIOSH: Pocket Guide to Chemical Hazards

Short Term Exposure Limit (STEL): 250 ppm, 325 mg/m<sup>3</sup>

US. NIOSH: Pocket Guide to Chemical Hazards

Skin designation: Can be absorbed through the skin.

**METHYL ALCOHOL; METHANOL**

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants

Time Weighted Average (TWA) Permissible Exposure Limit (PEL): 200 ppm, 260 mg/m<sup>3</sup>

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants

Ceiling Limit Value: 1,000 ppm,



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US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants

Short Term Exposure Limit (STEL): 250 ppm, 325 mg/m<sup>3</sup>

US. California Code of Regulations, Title 8, Section 5155. Airborne Contaminants

Skin designation: Can be absorbed through the skin.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

PEL: 200 ppm, 260 mg/m<sup>3</sup>

Ventilation:

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Respiratory Protection:

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. In the United States of America, if respirators are used, a program should be instituted to assure compliance with OSHA Standard 63 FR 1152, January 8, 1998. Respirator type: full-face positive-pressure air-supplied

Eye Protection:

Wear safety glasses with side shields (or goggles). Wear a full-face respirator, if needed.

Skin Protection:

Wear chemical-resistant gloves, footwear, and protective clothing appropriate for the risk of exposure. Contact health and safety professional or manufacturer for specific information.

Recommended Decontamination Facilities:

Eye bath, washing facilities, safety shower

9. PHYSICAL AND CHEMICAL PROPERTIES

|                                      |   |
|--------------------------------------|---|
| Physical Form:                       | Liquid  |
| Color:                               | Colorless   |
| Odor:                                | Sweet, alcohol  |
| Odor Threshold:                      | 100 ppm   |
| Specific Gravity:                    | 0.79 (20 C)   |
| Vapor Pressure:                      | 21 C; 133 mbar  |
| Vapor Density:                       | 1.1   |
| Freezing Point:                      | -98 C   |
| Boiling Point:                       | 65 C  |
| Evaporation Rate:                    | 2.6 (n-butyl acetate = 1 Evaporation Rate: 0.2 (diethyl ether = 1 ) |
| Viscosity:                           | 0.58 mPa.s (20 C) ,   |
| Solubility in Water:                 | Complete  |
| pH:                                  | Not applicable  |
| Octanol/Water Partition Coefficient: | P: 0.17; log P: -0.77   |
| Flash Point:                         | 10 C (Tag closed cup)   |
| Lower Flammable Limit:               | 6.61 %(V)   |
| Upper Flammable Limit:               | 36.5 %(V)   |
| Autoignition Temperature:            | 446 C (ASTM D2155)  |

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Thermal Decomposition Temperature: (DTA) No exotherm to boiling

## 10. STABILITY AND REACTIVITY

Stability:

Stable.

Incompatibility:

Material reacts with strong acids, strong bases. Material reacts violently with strong oxidizing agents

Hazardous Polymerization:

Will not occur.

## 11. TOXICOLOGICAL INFORMATION

General:

Prolonged and repeated exposure to high vapor concentrations, skin absorption or ingestion of methanol may result in visual disturbances, metabolic acidosis, headache, giddiness, nausea, insomnia, gastric disturbance, dizziness, and slow breathing. There have been severe cases reported of blindness, coma and death due to the ingestion of methanol. Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

|                              |                  |
|------------------------------|------------------|
| Oral LD-50: (rat)            | 6.2 g/kg         |
| Inhalation LC-50: (rat)      | 8 h: > 22500 ppm |
| Dermal LD-50: (rabbit)       | 15.8 g/kg        |
| Skin Irritation (guinea pig) | moderate         |
| Eye Irritation (rabbit)      | slight           |

## 12. ECOLOGICAL INFORMATION

Acute toxicity data, if available, are listed below. Additional toxicity data may be available on request.

Oxygen Demand Data:

BOD-5: 0.76 - 1.12 g/g

BOD-20: 1.26 g/g

COD: 1.05 - 1.5 g/g

Acute Aquatic Effects Data:

96 h LC-50 (fathead minnow): > 10000 microliter(s)/l NOEC:

10000 microliter(s)A

96 h LC-50 (sideswimmer): > 100 microliter(s)/l NOEC: 100 microliter(s)/l

24 h EC-50 (daphnid): > 10000 mg/l

96 h LC-50 (daphnid): > 1000 microliter(s)/l NOEC: 100 microliter(s)/l

96 h LC-50 (ramshorn snail): > 100 microliter(s)A NOEC: 100 microliter(s)/l

96 h LC-50 (aquatic earthworm): > 100 microliter(s)A NOEC: 100 microliter(s)A

96 h LC-50 (pill bug): > 100 microliter(s)A NOEC: 100 microliter(s)/l

96 h LC-50 (flatworm): > 100 microliter(s)/l NOEC: 100 microliter(s)/l

## 13. DISPOSAL CONSIDERATIONS

Discharge, treatment, or disposal may be subject to national, state, or local laws. Mix with compatible chemical which is less flammable and incinerate. Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container.

## UNIVAR USA - MSDS

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## 14. TRANSPORT INFORMATION

Marine pollutant components: None unless listed below

Reportable Quantity: 2,270 kg  
DOT (USA): Class 3 Packing group II  
ICAO Status: Class 3 Packing group II  
Subsidiary Risk Class 6.1  
IMDG Status: Class 3 Packing group II  
Subsidiary Risk Class 6.1

## 15. REGULATORY INFORMATION

WHMIS (Canada) Status: controlled  
WHMIS (Canada) Hazard Classification: B/2, D/1/B

SARA 311-312 Hazard Classification(s):  
immediate (acute) health hazard  
delayed (chronic) health hazard  
fire hazard

SARA 313: None, unless listed below

## METHANOL

Carcinogenicity Classification (components present at 0.1% or more):  
none, unless listed below

TSCA (US Toxic Substances Control Act): This product is listed on the TSCA inventory. Any impurities present in this product are exempt from listing.

DSL (Canadian Domestic Substances List) and CEPA (Canadian Environmental Protection Act): This product is listed on the DSL or otherwise complies with CEPA new substance notification requirements.

EINECS (European Inventory of Existing Commercial Chemical Substances):  
This product is listed on EINECS.  
EINECS Number: 200-659-6  
AICS / NICNAS (Australian Inventory of Chemical Substances and National Industrial Chemicals Notification and Assessment Scheme): This product is listed on AICS or otherwise complies with NICNAS.

MITI (Japanese Handbook of Existing and New Chemical Substances): This product is listed in the Handbook or has been approved in Japan by new substance notification.

ECL (Korean Toxic Substances Control Act): This product is listed on the Korean inventory or otherwise complies with the Korean Toxic Substances Control Act.

## 16. OTHER INFORMATION

For Additional Information:

Contact: MSDS Coordinator - Univar USA  
During business hours, Pacific Time - (425) 889-3400

## NOTICE

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Do not use ingredient information and/or ingredient percentages in this MSDS as a product specification. For product specification information refer to a Product Specification Sheet and/or a Certificate of Analysis. These can be obtained from your local Univar USA Sales Office.

All information appearing herein is based upon data obtained from the manufacturer and/or recognized technical sources. While the information is believed to be accurate, Univar USA makes no representations as to its accuracy or sufficiency. Conditions of use are beyond Univar USA's control. Therefore, users are responsible to verify this data under their own operating conditions to determine whether the product is suitable for their particular purposes, and they assume all risks of their use, handling, and disposal of the product or from the publication or use of, or reliance upon, information contained herein. This information relates only to the product designated herein and does not relate to its use in combination with any other material or in any other process.

END OF MSDS

**UNIVAR**

Univar USA Inc.  
17425 NE Union Hill Road  
Redmond, WA 98052  
(425) 889-3400

For Emergency Assistance involving chemicals call - CHEMTREC (800) 424-9300

The Version Date and Number for this MSDS is : 05/30/2006 - #007

\*\*\*\*\*  
PRODUCT IDENTIFICATION  
\*\*\*\*\*

PRODUCT NAME: ISOPAR C SOLVENT

MSDS NUMBER: EX834642

DATE ISSUED: 2/27/2003

SUPERCEDES: 2/20/2002

ISSUED BY: 008505

This MSDS was reviewed on 5/30/2006, and is  
current as of the DATE ISSUED above.

MATERIAL SAFETY DATA SHEET

SECTION 1 CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ISOPAR C FLUID

CHEMICAL NAME:

Synthetic Isoparaffinic Hydrocarbon CAS 64741-66-8

CHEMICAL FAMILY:

Aliphatic Hydrocarbon

PRODUCT DESCRIPTION:

Clear colorless liquid.

CONTACT ADDRESS:

ExxonMobil Chemical Company

P.O. Box 3272, Houston, Texas 77253-3272

\*\* EMERGENCY TELEPHONE NUMBERS: (24 Hours) \*\*  
\*\* CHEMTREC (800) 424-9300 \*\*  
\*\* ExxonMobil Chemical Company (800) 726-2015 \*\*

NON EMERGENCY TELEPHONE NUMBERS : (Sam-5pm M-F)

FOR GENERAL PRODUCT INFORMATION CALL : (281) 870-6000

FOR HEALTH AND MEDICAL INFORMATION CALL : (281) 870-6884

<http://commerce.univarusa.com/commerce/Uic?action=>

Post-it® Fax Note 7671

|           |     |      |        |            |   |
|-----------|-----|------|--------|------------|---|
| To        | MAK | Date | 7/11   | # of pages | 6 |
| Co./Dept. |     | From | Univar |            |   |
|           |     | Co.  | UNIVAR |            |   |

## UNIVAR USA - MSDS

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## SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

This product is hazardous as defined in 29 CFR1910.1200.

OSHA HAZARD

Flammable

## SECTION 3 HAZARDS IDENTIFICATION

## POTENTIAL HEALTH EFFECTS

## EYE CONTACT:

Slightly irritating but does not injure eye tissue.

## SKIN CONTACT:

Frequent or prolonged contact may irritate and cause dermatitis.

Low order of toxicity.

Skin contact may aggravate an existing dermatitis condition.

## INHALATION:

High vapor / aerosol concentrations (attainable at elevated temperatures well above ambient) are irritating to the eyes and the respiratory tract, and may cause headaches, dizziness, anaesthesia, drowsiness, unconsciousness, and other central nervous system effects, including death.

## INGESTION:

Small amounts of this product aspirated into the respiratory system during ingestion or vomiting may cause mild to severe pulmonary injury, possibly progressing to death.

Minimal toxicity.

## SECTION 4 FIRST AID MEASURES

## EYE CONTACT:

Flush eyes with large amounts of water until irritation subsides. If irritation persists, get medical attention.

## SKIN CONTACT:

Flush with large amounts of water; use soap if available.

Remove grossly contaminated clothing, including shoes, and launder before reuse.

## INHALATION:

Using proper respiratory protection, immediately remove the affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest. Call for prompt medical attention.

## INGESTION:

If swallowed, DO NOT induce vomiting. Keep at rest. Get prompt medical attention.

## SECTION 5 FIRE-FIGHTING MEASURES

FLASH POINT: 18 Deg F. METHOD: TCC ASTM D56 NOTE: Typical

FLAMMABLE LIMITS: LEL: 0.9 UEL: 6.3 @ 77 Deg F. NOTE: Approximate

AUTOIGNITION TEMPERATURE: 828 Deg F.

## GENERAL HAZARD

Extremely Flammable, material will readily ignite at ambient temperatures.

Static Discharge, material can accumulate static charges which can cause an incendiary electrical discharge.

"Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

## FIRE FIGHTING

Use water spray to cool fire exposed surfaces and to protect personnel.

Shut off "fuel" to fire. If a leak or spill has not ignited, use water

spray to disperse the vapors.

Either allow fire to burn under controlled conditions or extinguish with foam or dry chemical. Try to cover liquid spills with foam.

Avoid spraying water directly into storage containers due to danger of boilover.

This liquid is volatile and gives off invisible vapors. Either the liquid or vapor may settle in low areas or travel some distance along the ground or surface to ignition sources where they may ignite or explode.

#### DECOMPOSITION PRODUCTS UNDER FIRE CONDITIONS

No unusual

#### SECTION 6 ACCIDENTAL RELEASE MEASURES

##### LAND SPILL

Eliminate sources of ignition. Prevent additional discharge of material, if possible to do so without hazard. For small spills implement cleanup procedures; for large spills implement cleanup procedures and, if in public area, keep public away and advise authorities. Also, if this product is subject to CERCLA reporting (see Section 15 REGULATORY INFORMATION) notify the National Response Center.

Prevent liquid from entering sewers, watercourses, or low areas. Contain spilled liquid with sand or earth. Do not use combustible materials such as sawdust.

Recover by pumping (use an explosion proof or hand pump) or with a suitable absorbent.

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

##### WATER SPILL

Eliminate sources of ignition. Warn occupants and shipping in surrounding and downwind areas of fire and explosion hazard and request all to stay clear.

Remove from surface with suitable adsorbents. If allowed by local authorities and environmental agencies, sinking and/or suitable dispersants may be used in non-confined waters.

Consult an expert on disposal of recovered material and ensure conformity to local disposal regulations.

#### SECTION 7 STORAGE AND HANDLING

##### ELECTROSTATIC ACCUMULATION HAZARD:

Yes, use proper bonding and/or grounding procedure.

Additional information regarding safe handling of products with static accumulation potential can be ordered by contacting the American Petroleum Institute (API) for API Recommended Practice 2003, entitled "Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents" (American Petroleum Institute, 1220 L Street Northwest, Washington, DC 20005), or the National Fire Protection Association (NFPA) for NFPA 77 entitled "Static Electricity" (National Fire Protection Association, 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101).

|                             |                                       |
|-----------------------------|---------------------------------------|
| STORAGE TEMPERATURE, deg F: | LOADING/UNLOADING TEMPERATURE, deg F: |
| Ambient                     | Ambient                               |

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| STORAGE/TRANSPORT PRESSURE, mmHg: | LOADING/UNLOADING VISCOSITY, cSt: |
| Atmospheric                       | 0.9                               |

##### STORAGE AND HANDLING:

Keep container closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials.

Do NOT handle or store near an open flame, heat or other sources of ignition. Protect material from direct sunlight.

Material will accumulate static charges which may cause an electrical spark (ignition source). Use proper bonding and/or grounding procedures.

Do NOT pressurize, cut, heat, or weld containers. Empty product containers may contain product residue. Do NOT reuse empty containers



without commercial cleaning or reconditioning.

## SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

### EXPOSURE CONTROLS

The use of local exhaust ventilation is recommended to control process emissions near the source. Laboratory samples should be handled in a lab hood. Provide mechanical ventilation of confined spaces. See respiratory protection recommendations. Use explosion-proof ventilation equipment.

### PERSONAL PROTECTION

For open systems where contact is likely, wear safety glasses with side shields, long sleeves, and chemical resistant gloves. Where contact may occur, wear safety glasses with side shields. Where concentrations in air may exceed the limits given in this Section and engineering, work practice or other means of exposure reduction are not adequate, NIOSH approved respirators may be necessary to prevent overexposure by inhalation.

### WORKPLACE EXPOSURE GUIDELINES

ExxonMobil RECOMMENDS THE FOLLOWING OCCUPATIONAL EXPOSURE LIMITS:  
a TWA of 1400 mg/m3 (300 ppm) based on total hydrocarbon.

## SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

### SPECIFIC GRAVITY, at deg F:

0.70 at 60

### SOLUBILITY IN WATER, wt. % at deg F:

Less than 0.01 at 77

### SP. GRAY. OF VAPOR, at 1 atm (Air=1):

3.90 Calculated

### EVAPORATION RATE, n-Bu Acetate=1:

4.3

### VAPOR PRESSURE, mmHg at deg F:

36.9 at 68 Estimate

### VISCOSITY OF LIQUID, cSt at deg F:

0.7 at 77

### FREEZING/MELTING POINT, deg F:

-71 (Pour Point)

### BOILING POINT, deg F:

208 to 219

## SECTION 10 STABILITY AND REACTIVITY

### STABILITY:

Stable

### CONDITIONS TO AVOID INSTABILITY:

Not applicable

### HAZARDOUS POLYMERIZATION:

Will not occur

### CONDITIONS TO AVOID HAZARDOUS POLYMERIZATION:

Not applicable

### MATERIALS AND CONDITIONS TO AVOID INCOMPATIBILITY:

Strong oxidizing agents.

### HAZARDOUS DECOMPOSITION PRODUCTS:

None

## SECTION 11 TOXICOLOGICAL INFORMATION

Please refer to Section 3 for available information on potential health effects.

## SECTION 12 ECOLOGICAL INFORMATION

No specific ecological data are available for this product. Please refer to Section 6 for information regarding accidental releases and Section 15 for regulatory reporting information.

## SECTION 13 DISPOSAL CONSIDERATIONS

Please refer to Sections 5, 6, and 15 for disposal and regulatory information.

## SECTION 14 TRANSPORT INFORMATION

### DEPARTMENT OF TRANSPORTATION (DOT):

DOT SHIPPING DESCRIPTION: PETROLEUM DISTILLATE, N.O.S., 3, UN 1268, II



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## SECTION 15 REGULATORY INFORMATION

## TSCA:

This product is listed on the TSCA Inventory at CAS Registry Number 64741-66-8

## Clean Water Act/Oil Pollution Act:

This product is classified as an oil under Section 311 of the Clean Water Act (40 CFR 110) and the Oil Pollution Act of 1990. Discharge or spills which produce a visible sheen on either surface water, or in waterways/sewers which lead to surface water, must be reported to the National Response Center at 800-424-8802.

## CERCLA:

This product, as sold, is derived from a fraction of crude oil and is excluded from the spill reporting requirements by CERCLA Section 101(14)(F). When this product is used in a mixture or as an ingredient in another product or in a manufacturing operation, the petroleum exclusion may terminate and an accidental spill may require reporting to the National Response Center at 800-424-8802.

This product contains approximately 80% of 2,2,4 Trimethylpentane. The reportable quantity of 2,2,4 Trimethylpentane is 1,000 pounds.

## SARA TITLE III:

Under the provisions of Title III, Sections 311/312 of the Superfund Amendments and Reauthorization Act, this product is classified into the following hazard categories: Fire.

This information may be subject to the provisions of the Community Right-to-Know Reporting Requirements (40 CFR 370) if threshold quantity criteria are met.

This product does not contain Section 313 Reportable Ingredients.

## SECTION 16 OTHER INFORMATION

## HAZARD RATING SYSTEMS:

This information is for people trained in:

National Paint & Coatings Association's (NPCA)

Hazardous Materials Identification System (HMIS)

National Fire Protection Association (NFPA 704)

Identification of the Fire Hazards of Materials

|              | NPCA-HMIS | NFPA 704 | KEY          |
|--------------|-----------|----------|--------------|
| HEALTH       | 1         | 1        | 4 = Severe   |
| FLAMMABILITY | 3         | 3        | 3 = Serious  |
| REACTIVITY   | 0         | 0        | 2 = Moderate |
|              |           |          | 1 = Slight   |
|              |           |          | 0 = Minimal  |

CAUTION: HMIS ratings are based on a 0-4 rating scale with 1 representing minimal hazards or risks, and 4 representing significant hazards or risks. Recommended HMIS ratings should not be used in the absence of a fully implemented HMIS hazard communication program.

## REVISION SUMMARY:

Since 2/20/2002 this MSDS has been revised in Section(s):

3

REFERENCE NUMBER: HDHA-C-25035

For Additional Information:

## UNIVAR USA - MSDS

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Contact: MSDS Coordinator - Univar USA  
During business hours, Pacific Time - (425) 889-3400

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END OF MSDS



UNION CARBIDE CORPORATION  
A Subsidiary of The Dow Chemical Company  
**MATERIAL SAFETY DATA SHEET**



Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
PROOF SPEC  
MSDS#: 25387

Effective Date: 09/19/2000

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Union Carbide urges each customer or recipient of this MSDS to study it carefully to become aware of and understand the hazards associated with the product. The reader should consider consulting reference works or individuals who are experts in ventilation, toxicology, and fire prevention, as necessary or appropriate to use and understand the data contained in this MSDS.

To promote safe handling, each customer or recipient should: 1) Notify its employees, agents, contractors and others whom it knows or believes will use this material of the information in this MSDS and any other information regarding hazards or safety; 2) Furnish this same information to each of its customers for the product; and 3) Request its customers to notify their employees, customers, and other users of the product of this information.

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### 1.1 IDENTIFICATION

|                 |  |
|-----------------|--|
| Product Name    | ETHANOL, SDA-2B (HEPTANE) 200 PROOF SPEC |
| Chemical Name   | Denatured Ethyl Alcohol                  |
| Chemical Family | Alcohols                                 |
| Formula         | Not applicable (mixture)                 |
| Synonym         | Ethyl Alcohol SDA 2B-Heptane 200 Proof   |

### 1.2 COMPANY IDENTIFICATION

Union Carbide Corporation  
A Subsidiary of The Dow Chemical Company  
39 Old Ridgebury Road  
Danbury, CT 06817-0001

### 1.3 EMERGENCY TELEPHONE NUMBER

**24 hours a day: CHEMTREC 1-800-424-9300.**

Number for non-emergency questions concerning MSDS (732) 563-5522  
Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

## **MATERIAL SAFETY DATA SHEET**

Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
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### **2. COMPOSITION INFORMATION**

| Component | CAS #    | Amount (%W/W) |
|-----------|----------|---------------|
| Ethanol   | 64-17-5  | 99.14%        |
| Heptane   | 142-82-5 | 0.86%         |

### **3. HAZARDS IDENTIFICATION**

#### **3.1 EMERGENCY OVERVIEW**

**Appearance** Transparent colorless

**Physical State** Liquid

**Odor** Fragrant

**Hazards of product** WARNING! FLAMMABLE.  
CAUSES EYE IRRITATION.

#### **3.2 POTENTIAL HEALTH EFFECTS**

##### **Effects of Single Acute Overexposure**

**Inhalation** High vapor concentrations may cause a burning sensation in the nose and throat, and stinging and watering in the eyes. At concentrations which cause irritation, dizziness, faintness, drowsiness, nausea, and vomiting may also occur.

**Eye Contact** May cause irritation, experienced as stinging with excess blinking and tear production. Excess redness of the conjunctiva may occur.

**Skin Contact** No evidence of harmful effects from available information.

## **MATERIAL SAFETY DATA SHEET**

Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
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**Skin Absorption** No harmful effects with normal skin. However, potentially harmful amounts of material may be absorbed across markedly damaged skin when contact is sustained, particularly with children.

**Swallowing** May cause dizziness, faintness, drowsiness, decreased awareness and responsiveness, euphoria, abdominal discomfort, nausea, vomiting, staggering gait, lack of coordination, and coma.

### **Chronic, Prolonged or Repeated Overexposure**

**Effects of Repeated Overexposure** Long-term repeated oral exposure to ethanol may result in the development of progressive liver injury with fibrosis.

**Other Effects of Overexposure** Repeated ingestion of ethanol by pregnant mothers has been shown to adversely affect the central nervous system of the fetus, producing a collection of effects which together constitute the fetal alcohol syndrome. These include mental and physical retardation, disturbances of learning, motor and language deficiencies, behavioral disorders, and small size head.

### **Medical Conditions Aggravated by Exposure**

Repeated exposure to ethanol may aggravate liver injury produced from other causes.

## **3.3 POTENTIAL ENVIRONMENTAL EFFECTS**

See Section 12 for Ecological Information.

## **4. FIRST AID PROCEDURES**

### **4.1 INHALATION**

Remove to fresh air. Give artificial respiration if not breathing. If breathing is difficult, oxygen may be given by qualified personnel. Obtain medical attention.

### **4.2 EYE CONTACT**

Immediately flush eyes with water and continue washing for several minutes. Remove contact lenses, if worn. Obtain medical attention if discomfort persists.

### **4.3 SKIN CONTACT**

Wash skin with soap and water.

### **4.4 SWALLOWING**

If patient is fully conscious, give two glasses of water. Induce vomiting. This should be done only by medical or experienced first-aid personnel. Obtain medical attention.

## **MATERIAL SAFETY DATA SHEET**

Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
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### **4.5 NOTES TO PHYSICIAN**

Symptoms vary with the alcohol level of the blood. Mild alcohol intoxication occurs at blood levels between 0.05%-0.15% and approximately 25% of individuals will show signs of intoxication at these levels. Above 0.15% the person is definitely under the influence of ethanol and 50%-95% of individuals at this level are clinically intoxicated. Severe poisoning occurs when the blood ethanol level is 0.3%-0.5%. Above 0.5% the individual will be comatose and death can occur. The unabsorbed ethanol should be removed by gastric lavage after intubating the patient to prevent aspiration. Avoid the use of depressant drugs or the excessive administration of fluids. In the presence of hypoglycemia, administer 5%-10% glucose intravenously, plus thiamine 100 mg intramuscularly. Hemodialysis is indicated if the blood ethanol is above 5 mg/ml. Naloxone may be useful to reverse clinical alcoholic coma and 0.4-1.2 mg intravenously may arouse ethanol-intoxicated patients.

## **5. FIRE FIGHTING MEASURES**

### **5.1 FLAMMABLE PROPERTIES**

Flash Point - Closed Cup: Tag Closed Cup ASTM D 56 13 °C 55 °F

Flash Point - Open Cup: Tag Open Cup ASTM D 1310 18 °C 65 °F

Autoignition Temperature: Not currently available.

#### **Flammable Limits In Air:**

|       |                     |
|-------|---------------------|
| Lower | 3.3 %(V) (Ethanol)  |
| Upper | 19.0 %(V) (Ethanol) |

### **5.2 EXTINGUISHING MEDIA**

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

### **5.3 EXTINGUISHING MEDIA TO AVOID**

No information currently available.

### **5.4 SPECIAL FIRE FIGHTING PROCEDURES**

Use water spray to cool fire-exposed containers and structures.

### **5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS**

Use self-contained breathing apparatus and protective clothing.

## **MATERIAL SAFETY DATA SHEET**

Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
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### **5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS**

Vapors form from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges, or other ignition sources at locations distant from product handling point.

Vapors from this material may settle in low or confined areas or travel a long distance to an ignition source and flash back explosively.

Static ignition hazard can result from handling and use. Electrically bond and ground all containers, personnel and equipment before transfer or use of material. Special precautions may be necessary to dissipate static electricity for non-conductive containers. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77.

Avoid splash filling of containers when handling this flammable liquid because static electricity may be generated. Use proper bonding and grounding during product transfer as described in National Fire Protection Association Document NFPA 77.

See Section 8.3 - Engineering Controls

This material may produce a floating fire hazard.  
Flame may be invisible. Approach fire with caution.

### **5.7 HAZARDOUS COMBUSTION PRODUCTS**

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled. Carbon dioxide in sufficient concentrations can act as an asphyxiant.

## **6. ACCIDENTAL RELEASE MEASURES**

### **Steps to be Taken if Material is Released or Spilled:**

Extinguish and do not turn on any ignition source until the area is determined to be free from fire or explosion hazard. Small spills can be flushed with large amounts of water; larger spills should be collected for disposal. Observe government regulations.

**Personal Precautions:** Wear suitable protective equipment. See Section 8.2 - Personal Protection.

## **7. HANDLING AND STORAGE**

### **7.1 HANDLING**

#### **General Handling**

Keep away from heat, sparks and flame.

## **MATERIAL SAFETY DATA SHEET**

**Product Name:** ETHANOL, SDA-2B (HEPTANE) 200  
**PROOF SPEC**  
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Avoid breathing vapor.  
Avoid contact with eyes.  
Keep container closed.  
Use with adequate ventilation.  
Vapor forms from this product and may travel or be moved by air currents and ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharges or other ignition sources at locations distant from product handling point and may flash back explosively.  
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

### **Ventilation**

General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapor can be expected to escape to the workplace air.

### **Other Precautions**

Vapor may settle in low or confined areas, or travel a long distance to an ignition source and flash back explosively.

## **7.2 STORAGE**

Store in accordance with good industrial practices. Storage information may be obtained from product-specific Union Carbide Storage and Handling Guides, or by calling a Union Carbide Customer Service Representative.

## **8. EXPOSURE CONTROLS AND PERSONAL PROTECTION**

### **8.1 EXPOSURE LIMITS**

| <b>Component</b> | <b>Exposure Limits</b>   | <b>Skin</b> | <b>Form</b> |
|------------------|--|-------------|-------------|
| Ethanol          | 1000 ppm TWA8 ACGIH<br>1880 mg/m3 TWA8 ACGIH<br>1000 ppm TWA8 OSHA<br>1900 mg/m3 TWA8 OSHA |             |             |
| Heptane          | 1640 mg/m3 TWA8 ACGIH<br>400 ppm TWA8 ACGIH<br>2050 mg/m3 STEL ACGIH<br>500 ppm STEL ACGIH |             |             |
| Heptane          | 1600 mg/m3 TWA8 OSHA-<br>Vacated<br>400 ppm TWA8 OSHA-Vacated                              |             |             |



## **MATERIAL SAFETY DATA SHEET**

Product Name: ETHANOL, SDA-2B (HEPTANE) 200  
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2000 mg/m3 STEL OSHA-  
Vacated  
500 ppm STEL OSHA-Vacated  
500 ppm TWA8 OSHA  
2000 mg/m3 TWA8 OSHA

*In the Exposure Limits Chart above, if there is no specific qualifier (i.e., Aerosol) listed in the Form Column for a particular limit, the listed limit includes all airborne forms of the substance that can be inhaled.*

*A "Yes" in the Skin Column indicates a potential significant contribution to overall exposure by the cutaneous (skin) route, including mucous membranes and the eyes, either by contact with vapors or by direct skin contact with the substance. A "Blank" in the Skin Column indicates that exposure by the cutaneous (skin) route is not a potential significant contributor to overall exposure.*

### **8.2 PERSONAL PROTECTION**

**Respiratory Protection:** Use self-contained breathing apparatus in high vapor concentrations.

**Ventilation:** General (mechanical) room ventilation is expected to be satisfactory where this product is stored and handled in closed equipment. Special, local ventilation is needed at points where vapor can be expected to escape to the workplace air.

**Eye Protection:** Safety Glasses

**Protective Gloves:** Neoprene  
Polyvinyl chloride coated

**Other Protective Equipment:** Eye Bath, Safety Shower

### **8.3 ENGINEERING CONTROLS**

**PROCESS HAZARD:** Sudden release of hot organic chemical vapor or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions.

## **MATERIAL SAFETY DATA SHEET**

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Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapor."

### **9. PHYSICAL AND CHEMICAL PROPERTIES**

**Physical State:** Liquid

**Appearance:** Transparent colorless

**pH:** *Not currently available.*

**Solubility in Water (by weight):** 25 °C 100 %

**Odor:** Fragrant

**Flash Point - Closed Cup:** Tag Closed Cup ASTM D 56 13 °C 55 °F

**Flash Point - Open Cup:** Tag Open Cup ASTM D 1310 18 °C 65 °F

**Percent Volatiles:** 100 Wt%

**Boiling Point (760 mmHg):** 77 - 80 °C 171 - 176 °F

**Freezing Point:** < -100 °C < -148 °F

**Specific Gravity (H<sub>2</sub>O = 1):** 0.791 20 °C / 20 °C

**Vapor Pressure at 20°C:** 5.9 kPa 45 mmHg

**Vapor Density (air = 1):** 1.6

**Evaporation Rate (Butyl Acetate = 1):** 3.4

**Melting Point:** *Not applicable.*

### **10. STABILITY AND REACTIVITY**

## **MATERIAL SAFETY DATA SHEET**

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### **10.1 STABILITY/INSTABILITY** Stable

**Incompatible Materials:** Concentrated nitric or sulfuric acid; strong oxidizing agents.

### **10.2 HAZARDOUS POLYMERIZATION** Will Not Occur.

### **10.3 INHIBITORS/STABILIZERS** Not applicable.

## **11. TOXICOLOGICAL INFORMATION**

### **SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS**

The International Agency for Research on Cancer (IARC) has determined that the consumption of alcoholic beverages is causally related to the occurrence of malignant tumors of the oral cavity, pharynx, larynx, esophagus and liver in humans. The carcinogenic response attributed to drinking alcoholic beverages has not been verified in studies with laboratory animals. Established uses of denatured ethanol and non-beverage uses of pure ethanol are not considered to pose any significant cancer hazard. Ethanol has been shown to have a weak skin sensitizing potential in a very small percentage of the population.

## **12. ECOLOGICAL INFORMATION**

### **12.1 ENVIRONMENTAL FATE**

Information may be available, call Union Carbide.

### **12.2 ECOTOXICITY**

Information may be available, call Union Carbide.

## **MATERIAL SAFETY DATA SHEET**

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### **12.3 FURTHER INFORMATION**

None.

## **13. DISPOSAL CONSIDERATIONS**

### **13.1 WASTE DISPOSAL METHOD**

Incinerate in a furnace where permitted under Federal, State, and local regulations. Dispose in accordance with all applicable Federal, State, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

### **13.2 DISPOSAL CONSIDERATIONS**

See Section 13.1

*Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.*

## **14. TRANSPORT INFORMATION**

### **14.1 U.S. D.O.T.**

#### **NON-BULK**

**Proper Shipping Name :** ETHANOL SOLUTION

**Technical Name :** DENATURED ETHANOL

**ID Number :** UN 1170

**Hazard Class :** 3

**Packing Group :** PG II

#### **BULK**

**Proper Shipping Name :** ETHANOL SOLUTION

**Technical Name :** DENATURED ETHANOL

**ID Number :** UN 1170

**Hazard Class :** 3

**Packing Group :** PG II

## **MATERIAL SAFETY DATA SHEET**

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*This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.*

### **15. REGULATORY INFORMATION**

#### **15.1 FEDERAL/NATIONAL**

##### **COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 SECTION 103 (CERCLA)**

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting:

| Component    | CAS #   | Amount     |
|--------------|---------|------------|
| Methanol     | 67-56-1 | <= 0.0060% |
| Acetaldehyde | 75-07-0 | <= 0.0010% |
| Acetone      | 67-64-1 | <= 0.0002% |

##### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 302 AND 304**

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning:

None.

##### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTION 313**

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

None.

## **MATERIAL SAFETY DATA SHEET**

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### **SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 TITLE III (EPCRA) SECTIONS 311 AND 312**

Delayed Hazard : Yes  
Fire Hazard : Yes  
Immediate Health Hazard : Yes  
Reactive Hazard : No  
Sudden Release of Pressure Hazard : No

### **TOXIC SUBSTANCES CONTROL ACT (TSCA)**

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

## **15.2 STATE/LOCAL**

### **PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)**

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS:

| Component | CAS #   | Amount      |
|-----------|---------|-------------|
| Ethanol   | 64-17-5 | <= 99.1400% |

### **MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)**

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

| Component    | CAS #   | Amount      |
|--------------|---------|-------------|
| Ethanol      | 64-17-5 | <= 99.1400% |
| Acetaldehyde | 75-07-0 | <= 0.0010%  |

### **CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)**

This product contains the following chemical(s) known to the State of California to cause cancer:

| Component    | CAS #   | Amount     |
|--------------|---------|------------|
| Acetaldehyde | 75-07-0 | <= 0.0010% |

## **MATERIAL SAFETY DATA SHEET**

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### **CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)**

VOC: Not determined.

*This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.*

## **16. OTHER INFORMATION**

### **16.1 AVAILABLE LITERATURE AND BROCHURES**

ADDITIONAL INFORMATION: There may be additional product safety information on this product, which may be obtained by calling your Union Carbide Corporation Sales or Customer Service Contact.

### **16.2 SPECIFIC HAZARD RATING SYSTEM**

Additional information on this product may be obtained by calling the Union Carbide Corporation Customer Service Center at 1-800-568-4000.

### **16.3 RECOMMENDED USES AND RESTRICTIONS**

FOR INDUSTRY USE ONLY

### **16.4 REVISION**

Version: 2.

Revision: 09/19/2000

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

## **MATERIAL SAFETY DATA SHEET**

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### **16.5 LEGEND**

|              |  |
|--------------|--|
| A            | Asphyxiant                             |
| Bacterial/NA | Non Acclimated Bacteria                |
| F            | Fire                                   |
| H            | Health                                 |
| HMIS         | Hazardous Materials Information System |
| N/A          | Not available                          |
| NFPA         | National Fire Protection Association   |
| O            | Oxidizer                               |
| P            | Peroxide Former                        |
| R            | Reactivity                             |
| TS           | Trade Secret                           |
| VOL/VOL      | Volume/Volume                          |
| W            | Water Reactive                         |
| WW           | Weight/Weight                          |

*The opinions expressed herein are those of qualified experts within Union Carbide. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of the use of the product are not under the control of Union Carbide, it is the user's obligation to determine conditions of safe use of the product.*





## Material Safety Data Sheet

MSDS No.: BE273  
Variant: U.S.A.-EN  
Version No: 1.5  
Validation Date: 10/06/2003

# ARCOPURE® (HIGH PURITY MTBE)

### SECTION 1: IDENTIFICATION

**Product Name:** ARCOPURE® (HIGH PURITY MTBE)

**Product Number:** 000000000000499115

**Internal ID:** 354-1

**Chemical Family:** Alkyl ethers

**CAS Number:** 1634-04-4

**Chemical Name:** t-Butyl Methyl Ether

**Synonyms:** High Purity Tert-Butyl Methyl Ether, High Purity MTBE, Tert-Butyl Methyl Ether

**Manufacturer**

Lyondell Chemical Company  
One Houston Center, Suite 1600  
1221 McKinney St.  
P.O. Box 2583  
Houston Texas 77252-2583

**Business Contact**

Customer Service 888 777-0232  
Product Safety 800 700-0946

**24 Hour Emergency Contact**

CHEMTREC 800 424-9300  
LYONDELL 800-245-4532

### SECTION 2 : COMPOSITION/INFORMATION ON INGREDIENTS

| <u>Component Name</u> | <u>CAS #</u> | <u>EU Inventory</u> | <u>Concentration Wt.%*</u> | <u>Risk</u> | <u>Symbol</u> |
|-----------------------|--------------|---------------------|----------------------------|-------------|---------------|
| t-Butyl Methyl Ether  | 1634-04-4    | 216-653-1           | > 99.9                     | R11, R38    | F, Xi         |

- \* Concentration of gaseous products or materials is given in Mole %  
Compositions given are typical values not specifications.

### SECTION 3: HAZARD IDENTIFICATION

**Emergency Overview**

This material is HAZARDOUS by OSHA Hazard Communication definition.

**Signal Word**

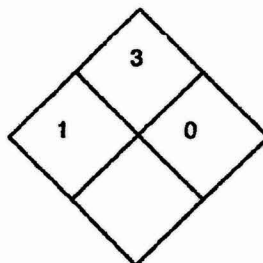
DANGER.

**Hazards**

Extremely flammable liquid. Eye irritant. Skin irritant. Not expected to be a skin absorption hazard. Not expected to be a sensitizer. Mucous membrane irritant. Inhalation hazard. Aspiration hazard. CNS depressant. Unpleasant terpentine-like taste in water.

# ARCOPURE® (HIGH PURITY MTBE)

NFPA®



HMIS®

|              |   |
|--------------|---|
| Health       | 1 |
| Flammability | 3 |
| Reactivity   | 0 |

**Physical State**  
 Liquid.

**Color**  
 Clear, colorless.

**Odor**  
 Terpentine-like odor.

**Odor Threshold**  
 0.053 ppm / Odor is not an adequate warning of potentially hazardous ambient air concentrations. Some individuals find the odor of MTBE objectionable (threshold for detection in air approx. 0.0002 mg/l; 0.053 ppm). Odor/taste threshold in water has been reported to be less than 5 ppb.

## Potential Health Effects

**Routes of Exposure**  
 Skin. Eye Inhalation

**Signs and Symptoms of Acute Exposure**  
 See component summary.

- *t*-Butyl Methyl Ether 1634-04-4  
 Eye irritant. Moderate skin irritant. Not a skin absorption hazard. Mucous membrane irritant. Overexposure may produce anesthetic or narcotic effects. Aspiration hazard.

**Skin**  
 May cause moderate skin irritation. Not expected to be a skin absorption hazard. Not expected to be a sensitizer.

**Inhalation**  
 Vapors may cause irritation of the eyes, nose and throat as well as CNS depression (fatigue, dizziness, loss of concentration, with collapse, coma and death possible in cases of severe overexposure). High vapor concentrations may be irritating to the upper respiratory tract.

**Eye**  
 Contact with the eyes may cause irritation consisting of reversible redness, swelling and mucous discharge to the conjunctiva.

**Ingestion**  
 Ingestion may cause discomfort and irritation of the gastrointestinal tract and CNS depression (fatigue, dizziness, collapse, coma and death). Aspiration into the lung may cause fatal chemical pneumonitis.

**Chronic Health Effects**  
 See component summary.

- *t*-Butyl Methyl Ether 1634-04-4

**ARCOPURE® (HIGH PURITY MTBE)**

Breathing mist or vapors may cause mucous membrane or upper respiratory tract irritation. Prolonged exposure may produce anesthetic and narcotic effects. Repeated or prolonged contact with skin may cause defatting and drying of the skin which may result in dermatitis. Chronic animal toxicity studies exposing rats and mice to MTBE have been performed. A description of these studies and an assessment of their results is presented elsewhere in this document. See section 11.

**Conditions Aggravated by Exposure**

Medical information regarding special health effects is not conclusive. This material may aggravate pulmonary/bronchial disease and/or cause breathing difficulty.

**SECTION 4: FIRST AID MEASURES**

---

**General**

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 3 of this MSDS., Assess rapidly and aggressively., Resuscitation may be indicated.

**Skin**

Promptly remove soiled clothing/wash thoroughly before reuse. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

**Inhalation**

If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain medical attention if breathing difficulty persists.

**Eye**

Immediately flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower lids. If pain or irritation persists, promptly obtain medical attention.

**Ingestion**

If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Do not induce vomiting. Risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

**Note to Physician**

There is no specific antidote. Do not induce vomiting. However, if vomiting occurs spontaneously, maintain open airway. Gastrointestinal decontamination in accidental petroleum distillate ingestions is not recommended, because of the severe aspiration hazard. All contaminated clothing should be removed, and contaminated skin areas washed with lipophilic soap, or green soap, and water. Gastric lavage is indicated in those patients who require decontamination. Be sure that an endotracheal tube is in place prior to lavage; use cuffed tubes in patients over 7 years of age. Although activated charcoal does not bind petroleum distillate products and may induce vomiting, charcoal may be administered when the physician feels the charcoal may absorb a toxic additive. A chest x-ray should be taken immediately after stabilization of breathing and circulation to document aspiration and detect the presence of pneumothorax. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

**SECTION 5: FIRE FIGHTING MEASURES**

---

**Flammable Properties****Classification**

OSHA/NFPA Class IB Flammable Liquid.

**Flash Point:**

~ -28 °C (-18.4 °F) (SETA)

**Auto-Ignition Temperature**

~ 374 °C (705.2 °F)

**Lower Flammable Limit**

~ 1.3 vol%

**Upper Flammable Limit**

**ARCOPURE® (HIGH PURITY MTBE)**

~ 8 vol%

**Extinguishing Media**

**Suitable:** SMALL FIRE: Use dry chemicals, CO<sub>2</sub>, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

**Unsuitable:** Do not use solid water stream/may spread fire.

**Protection of Firefighters**

**Protective Equipment/Clothing:** Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will only provide limited protection.

**Fire Fighting Guidance:** Releases flammable vapors below normal ambient temperatures. Flammable vapors may be heavier than air. May travel long distances along the ground before igniting and flashing back to vapor source. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. Move containers from fire area if you can do it without risk. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Do not use straight streams. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

**Hazardous Combustion Products:** Thermal decomposition may produce carbon monoxide and other toxic vapors.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

---

**Release Response**

Extremely flammable liquid. Release can cause fire or explosion. Eliminate all sources of ignition. All equipment used when handling this product must be grounded. Do not touch or walk through spilled material. Stop leak if you can do it without risk. Prevent entry into waterways, sewers, basements or confined areas. A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material. Water spray may reduce vapor; but may not prevent ignition in closed spaces. Dike large spills and place materials in salvage containers.

MTBE is highly volatile, partially water soluble and has only a minimal tendency to adhere to soil particles. Even small volumes can pose a threat to the environment and nearby water resources. Surface spills can reach groundwater through porous soil or cracked surfaces. All efforts should be made to prevent any leaks or spills, and to protect water resources. Where spills are possible, a comprehensive spill response plan should be developed and implemented. If a leak or spill reaches the groundwater, the groundwater may become contaminated. If the groundwater is a source of drinking water, the associated drinking water well(s) could become contaminated. MTBE can impart an unpleasant taste and odor to water at very low concentrations.

**SECTION 7: HANDLING AND STORAGE**

---

**Handling**

For industrial use only. Keep container tightly closed when not in use. Extinguish all ignition sources. Wear recommended personal protective equipment. Containers must be properly grounded before beginning transfer. All electrical equipment should be grounded and conform to applicable electric codes and regulatory requirements. Check atmosphere for explosiveness and oxygen deficiencies. Observe precautions pertaining to confined space entry. Use only non-sparking tools. Carefully vent any internal pressure before removing closure. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Handle empty containers with care; vapor/residue may be flammable.

**Storage**

Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents. Soft steel; avoid most plastics, Viton and Fluorel. Store closed drums with bung in up position. Vapor space above stored liquid may be flammable/explosive unless blanketed with inert gas.

**SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION**

---

**Engineering Controls**

**ARCOPURE® (HIGH PURITY MTBE)**

Both local exhaust and good general room ventilation must be provided not only to control exposure but also to prevent formation of flammable mixtures.

**Personal Protection**

**Inhalation** A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use. Use an approved respirator, either air-supplied or air purifying (consult your company safety professional, or Lyondell Industrial Hygiene group for guidance). The type of respiratory protection will depend upon whether the maximum exposure concentration is known.

**Skin** Wear chemical resistant gloves such as: Nitrile. or Polyvinyl Alcohol. Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn.

**Eye** Eye protection such as chemical splash goggles and/or face shield must be worn when possibility exists for eye contact due to splashing or spraying liquid, airborne particles, or vapor.

**Additional Remarks**

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

**Occupational Exposure Limits**

| Component Name       | Source / Date     | Value  | Type      | Notation |
|----------------------|-------------------|--------|-----------|----------|
| t-Butyl Methyl Ether | US (ACGIH) / 2003 | 50 ppm | 8 HRS/TWA | No       |
|                      | US (OSHA) / 2003  | NL     |           |          |

**SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES**

**Appearance:** Liquid. Clear, colorless.

**Odor:** Terpentine-like odor.

**Odor Threshold:** 0.053 ppm Odor is not an adequate warning of potentially hazardous ambient air concentrations. Some individuals find the odor of MTBE objectionable (threshold for detection in air approx. 0.0002 mg/l; 0.053 ppm). Odor/taste threshold in water has been reported to be less than 5 ppb.

**pH:** Not applicable.

**Boiling Point/Boiling Range:** ~ 55 °C (131 °F) @ 760 mm Hg

**Freezing Point/Melting Point:** ~ -109 °C (-164.2 °F)

**Flash Point:** ~ -28 °C (-18.4 °F) (SETA)

**Auto-ignition:** ~ 374 °C (705.2 °F)

**Flammability:** OSHA/NFPA Class IB Flammable Liquid.

**Lower Flammable Limit:** ~ 1.3 vol%

**Upper Flammable Limit:** ~ 8 vol%

**Explosive Properties:** Not Applicable.

**Oxidizing Properties:** Not Applicable.

**ARCOPURE® (HIGH PURITY MTBE)**

**Vapor Pressure:** ~ 245 mm Hg @ 25 °C (77 °F)

**Evaporation Rate:** No Data Available.

**Relative Density:** ~ 0.74 @ 20 °C (68 °F) (Water = 1.0 at 4°C (39.2°F))

**Relative Vapor Density:** ~ 3 @ 20 °C (68 °F) (Air = 1.0)

**Viscosity:** ~ 0.3 mPa.s @ 25 °C (77 °F)

**Solubility (Water):** Moderate (1 to less than 10 Percent).

**Partition Coefficient (Kow):** Log Pow = -0.8 to -1.33

**Additional Physical and Chemical Properties:** Additional properties may be listed in Sections 3 and 5.

**SECTION 10: STABILITY AND REACTIVITY**

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**Chemical Stability**

This material is stable when properly handled and stored.

**Conditions to Avoid**

Heat, sparks, open flame, other ignition sources, and oxidizing conditions.

**Substances to Avoid**

Strong oxidizing agents. Strong acids.

**Hazardous Polymerization**

Not expected to occur.

**Reactions with Air and Water**

Not expected to occur.

**SECTION 11: TOXICOLOGICAL INFORMATION**

---

**PRODUCT INFORMATION**

---

**Product Summary**

MTBE is of slight acute toxicity, although inhalation exposure to high concentrations may cause dizziness, CNS depression, loss of consciousness and irritation to the eye and upper respiratory tract. Some individuals find the odor of MTBE objectionable. Skin contact with undiluted product may lead to moderate irritation, while repeated exposure can cause cracking due to defatting of the dermis. It is not a skin sensitizer. Neat liquid MTBE may cause mild, reversible eye irritation. Liver enlargement, without evidence of structural organ damage, is commonly seen in rats and mice after repeated exposure, while male rats exhibit a sex- and species-specific accumulation of protein droplets in proximal tubules of the kidney. Changes in estrogen-sensitive tissues were reported in female mice exposed to high concentrations of MTBE vapor, however serum estrogen levels and estrogen receptor functions were unaffected. MTBE has no adverse effect on reproduction and is not selectively toxic to the fetus. Although formaldehyde is a possible metabolite that may be formed in simple in vitro systems, results from in vivo genotoxicity tests are consistently negative. Long term inhalation exposure to very high doses was associated with an increased incidence of liver tumors in female mice and kidney- and testis tumors in male rats.

**COMPONENT INFORMATION**

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- *t*-Butyl Methyl Ether 1634-04-4

**Acute Toxicity - Lethal Doses**



**ARCOPURE® (HIGH PURITY MTBE)**

|                    |         |                        |         |
|--------------------|---------|------------------------|---------|
| <u>LC50 (Inhl)</u> | Rat     | 23,800 - 39,800<br>PPM | 4 HOURS |
| <u>LD50 (Oral)</u> | Rat     | 3800 MG/KG             |         |
| <u>LD50 (Skin)</u> | Rabbit. | > 10,000 MG/KG         |         |

**Target Organ Effects**

Skin. Eye. Respiratory system. CNS depressant.

**Repeated Dose Toxicity**

No evidence of adverse systemic effects was seen in rodents exposed repeatedly to low concentrations of MTBE vapor, however higher exposures were associated with an accumulation of protein droplets in the kidney of male rats (a male rat-specific response), with liver enlargement (but no adverse histopathological lesions) in rats and mice of both sexes. A decreased incidence of cystic endometrial hyperplasia and changes in other estrogen-sensitive tissues were reported in female mice exposed to 28.6 mg/l (8,000 ppm) MTBE vapor, however serum estrogen levels and estrogen receptor functions were unaffected. There are inconsistent reports of minor subjective neurological symptoms in humans regularly exposed to low levels of MTBE vapor. It is unclear, however, if these are causally-related to MTBE or were triggered by its odor. Some individuals find the odor of MTBE objectionable (threshold for detection 0.0002 mg/l; 0.053 ppm).

**Reproductive Effects**

No adverse effect on reproductive function or gonad histopathology seen in male and female rats exposed to 28.6 mg/l (8,000 ppm) MTBE vapor over two generations.

**Developmental Effects**

MTBE is not selectively toxic to the fetus. No adverse developmental effects were reported in rabbits exposed to high concentrations during pregnancy, despite the occurrence of maternal toxicity (CNS effects, significantly lower food intake, significantly lower maternal body weight). Similar maternal signs were noted in mice exposed under similar conditions, however in this instance an increased incidence of cleft palate was apparent in the offspring. Cleft palate is a stress-related phenomenon in the mouse hence this observation was considered secondary to maternal toxicity in this species.

**Genetic Toxicity**

MTBE has been tested extensively for genotoxic activity in a range of in vitro and in vivo tests. While the majority of results are negative, weak positive findings (consistent with the metabolism of MTBE to formaldehyde by S9 fraction in vitro) have been obtained with *Salmonella typhimurium* TA102 and L5178Y TK+/- mouse lymphoma cells. Consistently negative results have been obtained from in vivo tests, however, and indicate that formation of free formaldehyde in the body is negligible. Overall, the weight of evidence indicates that MTBE is not a genotoxin.

**Carcinogenicity**

Studies in experimental animals have found only limited evidence for the carcinogenicity for MTBE, with tumors occurring in tissues or via mechanisms considered not relevant to humans. Female mice exposed by inhalation to up to 28.6 mg/l (8,000 ppm) MTBE vapor responded with an increased incidence of liver tumors, while male rats developed tumors in testis and kidney under similar conditions. Mechanistic studies have shown important differences in the disposition and fate of MTBE in rodents and humans, suggesting that these findings after long-term inhalation exposure are not indicative of a risk to health. Results are also available from a life-time study of non-standard design, which reported an increased incidence of combined lymphoma/leukemia in female rats given MTBE by gavage, however inadequacies in the design and reporting of this investigation limit confidence in the result. Critically, MTBE is not genotoxic indicating that a direct effect on DNA is unlikely. Listed by IARC as not classifiable as to its carcinogenicity to humans (Group 3). This listing is based on inadequate evidence in humans and limited evidence of carcinogenicity in experimental animals.

**SECTION 12: ECOLOGICAL INFORMATION**

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**PRODUCT INFORMATION**

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**Ecotoxicity**

This material is expected to be non-hazardous to aquatic species. See component summary.

**Environmental Fate and Pathway**

**ARCOPURE® (HIGH PURITY MTBE)**

MTBE presents a potential concern to groundwater supplies. Small amounts (by some accounts in the below one part per billion range) of MTBE or gasoline blended with MTBE may impart an unpleasant and distasteful odor and taste to groundwater which can render such groundwater unsuitable for consumption. Therefore, care should be used when handling, storing or transferring MTBE or gasoline blended with MTBE to insure that such product is not released into the environment and is not allowed to migrate to groundwater. Because of its solubility in water (4.3%) and relatively low organic carbon partitioning coefficient ( $K_{oc}=11$ ), MTBE is mobile in soil and, accordingly, every release into the environment has the potential for damaging groundwater supplies. Once in the groundwater, MTBE tends to migrate faster and farther than most other hydrocarbons and is typically present at the leading edge of a groundwater contaminant plume. MTBE may not biodegrade as promptly as other gasoline constituents and may require additional and more costly remediation procedures. Other information regarding MTBE is available through the Chemical Abstracts Service, American Petroleum Institute publications, the U.S. Environmental Protection Agency and elsewhere.

**Other Adverse Effects**

This material does not adhere readily to soil particles and may travel rapidly and extensively in a groundwater plume. Therefore, groundwater remediation efforts may be difficult and extensive. As a VOC, MTBE can contribute to the formation of photochemical smog in the presence of other VOC's.

**COMPONENT INFORMATION**

---

- ***t*-Butyl Methyl Ether 1634-04-4**

**Ecotoxicity**

This material is expected to be non-hazardous to aquatic species.

**Acute toxicity to fish**

LC50 / 96 HOURS fathead minnow 672 - 980 mg/l

LC50 / 96 HOUR rainbow trout. 887 mg/l

LC50 / 96 HOUR bluegill sunfish 1,054 mg/l

LC50 / 96 HOUR silverside minnow. 574 mg/l

LC50 / 96 HOUR sheepshead minnow. 1,358 mg/l

**Acute toxicity to aquatic invertebrates**

EC50 / 48 HOUR Daphnia magna. 472 - 681 mg/l

LC50 / 48 HOUR waterflea. 340 mg/l

EC50 / 96 HOUR saltwater mysid. 136 - 187 mg/l

**Toxicity to aquatic plants**

IC50 / 96 HOUR green algae (Selenastrum). 491 mg/l

**Toxicity to microorganisms**

Summary: No Data Available.

**Chronic toxicity to fish**

IC50 / 31 DAY fathead minnow 279 mg/l

**Chronic toxicity to aquatic invertebrates**

NOEC50 / 28 DAY saltwater mysid. 26 mg/l

Summary: May pose slight chronic toxicity in specific invertebrates.



## ARCOPURE® (HIGH PURITY MTBE)

### Environmental Fate and Pathway

MTBE presents a potential concern to groundwater supplies. Small amounts (by some accounts in the below one part per billion range) of MTBE or gasoline blended with MTBE may impart an unpleasant and distasteful odor and taste to groundwater which can render such groundwater unsuitable for consumption. Therefore, care should be used when handling, storing or transferring MTBE or gasoline blended with MTBE to insure that such product is not released into the environment and is not allowed to migrate to groundwater. Because of its solubility in water (4.3%) and relatively low organic carbon partitioning coefficient ( $K_{oc}=11$ ), MTBE is mobile in soil and, accordingly, every release into the environment has the potential for damaging groundwater supplies. Once in the groundwater, MTBE tends to migrate faster and farther than most other hydrocarbons and is typically present at the leading edge of a groundwater contaminant plume. MTBE may not biodegrade as promptly as other gasoline constituents and may require additional and more costly remediation procedures. Other information regarding MTBE is available through the Chemical Abstracts Service, American Petroleum Institute publications, the U.S. Environmental Protection Agency and elsewhere.

#### Mobility

Transport between environmental compartments: The atmosphere is the main environmental compartment for releases of MTBE. In water, volatilization will result in substantial losses to the atmosphere with a half-life of 5-6 days.

#### Persistence and Degradability

Biodegradation: Two OECD 301D studies (closed bottle test) showed negligible (0-2%) biodegradation after 28 days. Not readily biodegradable under aerobic conditions. However, degradation has been observed in non-standard tests using pure- and mixed bacterial cultures.

Bioaccumulation: Log Kow (Fish) <3 This material is not expected to bioaccumulate.

#### Other Adverse Effects

This material does not adhere readily to soil particles and may travel rapidly and extensively in a groundwater plume. Therefore, groundwater remediation efforts may be difficult and extensive. As a VOC, MTBE can contribute to the formation of photochemical smog in the presence of other VOC's.

### SECTION 13: DISPOSAL CONSIDERATIONS

Contaminated products/soil/water may be Resource Conservation and Recovery Act (RCRA) hazardous waste/ Occupational Safety and Health Administration (OSHA) hazardous material due to low flash point (see 40 Code of Federal Regulations (CFR) 261 and 29 CFR 1910). Assure effluent complies with applicable regulations. Landfill solids at permitted sites. Use registered transporters. Burn concentrated liquids in systems designed for low flash point material. Avoid flame-outs. Assure emissions comply with applicable regulations. Avoid overloading/poisoning plant biomass. Dilute aqueous waste may biodegrade.

### SECTION 14: TRANSPORT INFORMATION

#### Proper Shipping Name

|          |                         |
|----------|-------------------------|
| CFR_RAIL | Methyl tert-butyl ether |
| IMDG     | METHYL BUTYL ETHER      |

|    |                         |
|----|-------------------------|
| RQ | Methyl tert-butyl ether |
|----|-------------------------|

|        |          |        |
|--------|----------|--------|
| ID No. | CFR_RAIL | UN2398 |
| ID No. | IMDG     | UN2398 |

|              |          |   |
|--------------|----------|---|
| Hazard Class | CFR_RAIL | 3 |
| Hazard Class | IMDG     | 3 |

|    |          |    |
|----|----------|----|
| PG | CFR_RAIL | II |
| PG | IMDG     | II |

### SECTION 15: REGULATORY INFORMATION

#### Regulatory Status



## Material Safety Data Sheet

MSDS No.: BE273  
Variant: U.S.A.-EN  
Version No: 1.5  
Validation Date: 10/06/2003

### ARCOPURE® (HIGH PURITY MTBE)

| Country        | Inventory |   | <b>X = All components are included or are otherwise exempt from inclusion on this inventory.</b><br><br><b>C = Contact Lyondell/Equistar by e-mail at <a href="mailto:product.safety@lyondell.com">product.safety@lyondell.com</a> or <a href="mailto:product.safety@equistarchem.com">product.safety@equistarchem.com</a> for additional information.</b> |
|----------------|-----------|---|--|
| Australia      | AICS      | X |  |
| Canada         | DSL       | X |  |
| Canada         | NDSL      |   |  |
| China          | IECS      | X |  |
| European Union | EINECS    | X |  |
| European Union | ELINCS    |   |  |
| European Union | NLP       |   |  |
| Japan          | ENCS      | X |  |
| Korea          | ECL       | X |  |
| Philippines    | PICCS     | X |  |
| United States  | TSCA      | X |  |

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

#### SARA 302/304

This material contains a component(s) with known CAS numbers classified as hazardous substances subject to the reporting of CERCLA (40 CFR 302) and/or to the release reporting requirements of SARA (Section 302) based on reportable quantities (RQs).

##### Component

Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

##### RQ

1,000 lbs

#### SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Fire Hazard.

Immediate (Acute) Health Hazard.

#### SARA 313

This material contains the following chemicals with known CAS numbers subject to the reporting requirements of SARA Title III, Section 313 and 40 CFR 372:

##### Component

Methyl t-Butyl Ether / CAS# 1634-04-4

##### Reporting Threshold

1.0%

#### State Reporting

This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

Massachusetts Substances List (MSL) - Hazardous substances on the MSL must be identified when present in materials at levels greater than state specified criterion. The criterion is:  $\geq 1\%$ . Components with CAS numbers present in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is  $\geq 1\%$ . Components with CAS numbers in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.



## Material Safety Data Sheet

MSDS No.: BE273  
Variant: U.S.A.-EN  
Version No: 1.5  
Validation Date: 10/06/2003

# ARCOPURE® (HIGH PURITY MTBE)

Environmentally Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is  $\geq 1\%$ . Components with CAS numbers in this material at a level which could require reporting under the statute are:

- Methyl Tertiary Butyl Ether / CAS# 1634-04-4.

## SECTION 16: OTHER INFORMATION

---

### Latest Revision(s)

Revised Section(s): 3 6 9 11 12 16 Date of Revision: October 2 2003

---

### DISCLAIMER OF RESPONSIBILITY

This document is generated for the purpose of distributing health, safety, and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

### Product Specific Information

Further environmental, safety, use and handling information pertaining to this product is available within Lyondell's "MTBE Product Safety Bulletin", which can be obtained from Lyondell Chemical Company.

### Numerical Data Presentation

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg

### Language Translations

The information presented in this document has been translated from English by a vendor Lyondell believes to be reliable. Lyondell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no responsibility for any errors that may have occurred. Please refer to our web sites ([www.lyondell.com](http://www.lyondell.com) and [www.equistarchem.com](http://www.equistarchem.com)) for the original document written in English.

< end of document >

# COGNIS CORPORATION

## Material Safety Data Sheet

### SECTION 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

PRODUCT NAME: LOROL C8-98  
 PRODUCT DESCRIPTION: FATTY ALCOHOLS  
 SYNONYMS: 1-OCTANOL  
 OCTYL ALCOHOL

CASRN: 111-87-5  
 MANUFACTURER: Cognis Corporation  
 4900 Este Avenue  
 Cincinnati, OH 45232  
 Phone: 800-543-7370

EMERGENCY NUMBERS:  
 CHEMTREC: 800-424-9300

Revised: 05/10/2002  
 Supersedes: 09/04/2001

**DISTRIBUTED BY:**  
**STOCKTON SALES, INC.**  
 1 Rossmore Drive  
 Unit B-3  
 Monroe Twp., NJ 08831  
 (609) 395-8700

Fax: 513-482-5505

### SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

| CHEMICAL                    | CONCENTRATION (Wt.%) | EXPOSURE LIMITS  |
|-----------------------------|----------------------|------------------|
| 1-Octanol<br>CASRN 111-87-5 | > 98.0               | None Established |

### SECTION 3: HAZARDS IDENTIFICATION

\*\*\*\*\* Emergency \*\*\*\*\*  
 \*\*\*\*\* Overview \*\*\*\*\*

#### WARNING!

Combustible liquid and vapor.  
 Causes skin and eye irritation.  
 Keep away from heat, spark, and open flames.  
 Avoid contact with eyes, skin and clothing. Avoid breathing mist,  
 vapour or dust. Keep container closed. Use with adequate ventilation.  
 Wash thoroughly after handling.

Colorless liquid

\*\*\*\*\*

#### SKIN CONTACT:

May cause skin irritation, and may be harmful if absorbed through skin.

#### EYE CONTACT:

Contact with the eye causes irritation.

#### INHALATION:

INHALATION OF mist or vapor may cause pulmonary edema or congestion.  
Inhalation may also cause central nervous system depression, and  
irritation of the respiratory system.

INGESTION:

May be harmful if swallowed. Avoid ingestion.

CHRONIC EFFECTS:

None Known.

OTHER HEALTH EFFECTS:

None known.

PRIMARY ROUTES OF EXPOSURE: Skin

-----  
SECTION 4: FIRST AID MEASURES  
-----

SKIN CONTACT:

Immediately flush skin with plenty of water while removing contaminated clothing. Get medical attention immediately. Wash contaminated clothing before reuse.

EYE CONTACT:

Flush eyes with plenty of water for at least 15 minutes. Do not permit victim to rub eyes. Get medical attention immediately.

INHALATION:

Immediately remove victim to fresh air. If victim has stopped breathing give artificial respiration, preferably, mouth to mouth. Get medical attention immediately.

INGESTION:

Do not induce vomiting. Give large amounts of water followed by milk if available. If vomiting should occur spontaneously, keep airway clear. Get medical attention. Never give anything by mouth to an unconscious person.

-----  
SECTION 5: FIRE FIGHTING MEASURES  
-----

Flash Point: 194      Deg F ( Method Unknown )

LFL: Not Determined

UFL: Not Determined

AUTOIGNITION TEMPERATURE Not Determined

RECOMMENDED EXTINGUISHING MEDIA:

Carbon dioxide, Dry chemical, Foam, Water spray

SPECIAL FIRE FIGHTING PROCEDURES:

Use water spray, dry chemical, foam or carbon dioxide. Water may be ineffective but should be used to keep fire exposed containers cool.

Page: 3

ENGINEERING CONTROLS:  
Handle in the presence of adequate ventilation.

-----  
SECTION 9: PHYSICAL and CHEMICAL PROPERTIES  
-----

PHYSICAL STATE: Liquid  
APPEARANCE: Colorless liquid  
ODOR: Mild  
ODOR THRESHOLD: N/D  
pH: Not Determined  
MELTING POINT: -17 Deg C  
BOILING POINT: 185-200 Deg C  
SPECIFIC GRAVITY: .815-.825@ 20 C  
SOLUBILITY IN WATER: Insoluble  
PERCENT VOLATILES (by Wt.): NIL @ 70 Deg F.  
VAPOR DENSITY: Heavier than Air  
VAPOR PRESSURE: Not Determined  
EVAPORATION RATE (N-BUTYL ACETATE=1): Not determined  
VOC CONTENT (EPA Method 24): Not Determined

-----  
SECTION 10: STABILITY AND REACTIVITY  
-----

STABILITY: Normally Stable

HAZARDOUS POLYMERIZATION: Will not occur.

INCOMPATIBLE MATERIALS:  
Strong acids, bases and oxidizing agents.

CONDITIONS TO AVOID:  
Avoid contact with heat, sparks, flame and all sources of ignition.

HAZARDOUS DECOMPOSITION PRODUCTS:  
Decomposition produces carbon monoxide and carbon dioxide.

-----  
SECTION 11: TOXICOLOGICAL INFORMATION  
-----

| TYPE OF STUDY     | RESULTS    | SPECIES |
|-------------------|------------|---------|
| ORAL LD(50)       | >2000mg/kg | Rat     |
| INHALATION LC(50) | 5600 mg/m3 | Rat     |

Similar materials are known to cause varying degrees of eye irritation.

-----  
SECTION 12: ECOLOGICAL INFORMATION  
-----



ECOLOGICAL TOXICITY:  
Not Determined

ENVIRONMENTAL FATE:  
Not Determined

-----  
SECTION 13: DISPOSAL CONSIDERATIONS  
-----

All recovered material should be packaged, labeled, transported, and disposed or reclaimed in conformance with applicable laws and regulations and in conformance with Good Engineering Practices. Avoid landfilling of liquids. Reclaim where possible.

-----  
SECTION 14: TRANSPORTATION INFORMATION  
-----

COMBUSTIBLE LIQUID, N.O.S. (1-Octanol),  
Combustible Liquid, NA1993, PG III, ERG# 128  
ATTACHED, ALCOHOLS, INEDIBLE FATTY, NOI, OF  
VEGETABLE OILS NMFC: 145100

The information provided is for domestic highway transportation only. This product may be regulated differently when shipped in other types of containers or by modes other than that addressed by this section of the MSDS. For information, please contact Regulatory Affairs at 513/482-5022.

For RQ applicability, please see Section XV.

-----  
SECTION 15: REGULATORY INFORMATION  
-----

TSCA INVENTORY STATUS:

This product and/or all of its components are either included on or exempt from the TSCA Inventory of Chemical Substances.

TSCA 12(b) COMPONENTS:

None

SARA 311/312 HAZARD CATEGORIES: Acute, Fire

SARA 313 TOXIC CHEMICALS:

None

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES:

None

CERCLA HAZARDOUS SUBSTANCES:

None



## CALIFORNIA PROPOSITION 65 COMPONENTS:

None

-----  
SECTION 16: OTHER INFORMATION  
-----

HMIS RATINGS: HEALTH: 2 FLAMMABILITY: 2 REACTIVITY: 0

NFPA RATINGS: HEALTH: 1 FLAMMABILITY: 2 REACTIVITY: 0 OTHER: None

THE FOLLOWING WARNING INFORMATION IS PROVIDED ON THE LABEL FOR THIS PRODUCT:  
-----

## WARNING!

Combustible liquid and vapor.

Causes skin and eye irritation.

Keep away from heat, spark, and open flames.

## FIRST AID - INHALATION:

Immediately remove victim to fresh air. If victim has stopped breathing give artificial respiration, preferably, mouth to mouth. Get medical attention immediately.

## FIRST AID - SKIN CONTACT:

Immediately flush skin with plenty of water while removing contaminated clothing. Get medical attention immediately. Wash contaminated clothing before reuse.

## FIRST AID - EYE CONTACT:

Flush eyes with plenty of water for at least 15 minutes. Do not permit victim to rub eyes. Get medical attention immediately.

## STEPS TO TAKE IN CASE OF SPILL OR LEAK:

Remove ignition sources. Add dry material to absorb spill (if large spill, dike to contain). Using recommended protective and explosion-proof equipment, pick up and containerize for recovery or disposal. Flush area with water, collect for disposal.

## HANDLING AND STORAGE:

Do not store or handle product in the presence of heat, sparks, or open flame. Ground and bond container when transferring.

Container hazardous when empty. Since empty containers retain product residues, all hazard precautions described on this MSDS must be observed.

Avoid contact with eyes, skin and clothing. Avoid breathing mist, vapour or dust. Keep container closed. Use with adequate ventilation. Wash thoroughly after handling.

FOR INDUSTRIAL USE ONLY.

-----  
ABBREVIATIONS USED:

ND or N/D = Not Determined

NA or N/A = Not Applicable or Not Available

NE or N/E = Not Established

N/AP = Not Applicable

-----  
All information, recommendations, and suggestions appearing herein

concerning our product are based upon tests and data believed to be reliable. However, it is the user's responsibility to determine the safety, toxicity, and suitability for his own use of the product described herein. Since the actual use by others is beyond our control, no guarantee, express or implied, is made by Cognis Corporation as to the effects of such use, the results obtained, or the safety and toxicity of the product nor does Cognis Corporation assume any liability arising out of use, by others, of the product referred to herein. The information herein is not to be construed as absolutely complete since additional information may be necessary or desirable when particular or exceptional conditions or circumstances exist or because of applicable laws or government regulations.

---

PREPARED BY:

Robert E. Borgerding  
Cognis Corporation  
Product Safety/Regulatory Affairs  
4900 Este Avenue  
Cincinnati, OH 45232

513/482-2820 (Voice) 513/482-2007 (Fax)

Sasol North America Inc.  
P.O. Box 19029  
Houston, Texas 77224-9029  
Phone (281) 588-3000



## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

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PREPARED BY: Sasol North America Inc. Safety, Health and Environmental Department  
PHONE NUMBER: (281) 588-3491



Sasol North America Inc.  
P.O. Box 19029  
Houston Texas 77224-9029  
Phone (281) 588-3000

**ALFOL® 6 ALCOHOL**

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

# MATERIAL SAFETY DATA SHEET

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: ALFOL® 6 ALCOHOL  
SYNONYMS: 1-Hexanol, Hexyl Alcohol

MANUFACTURER: Sasol North America Inc.  
ADDRESS: 900 Threadneedle, Houston, TX 77079

TELEPHONE NUMBERS: CHEMTREC - Transportation Emergency (24-hr) (800) 424-9300  
Other Emergencies (24-hrs) (337) 494-5142  
MSDS and Product Information (8:00am-4:30pm CST) (281) 588-3491  
Health and Safety Information (8:00am-4:00pm CST) (337) 494-5403

## 2. COMPOSITION / INFORMATION ON INGREDIENTS

### Components

|           | <u>CAS Number</u> | <u>Weight%</u> |
|-----------|-------------------|----------------|
| 1-Hexanol | 111-27-3          | 99.5           |

See Section 8 for Exposure Guidelines and Section 15 for Regulatory Classifications.

## 3. HAZARDS IDENTIFICATION

### Emergency Overview

Colorless liquid. Sweet, pungent odor.

**HEALTH HAZARD:** WARNING! CAUSES EYE IRRITATION. Vapors may cause irritation of nose, throat, dizziness, and headache. Contact may irritate or burn skin and eyes.

**FIRE OR EXPLOSION:** COMBUSTIBLE LIQUID AND VAPOR. May be ignited by heat, sparks or flames. Vapors may travel to a source of ignition and flash back. Container may explode in heat of fire.

**DISTRIBUTED BY:**  
**STOCKTON SALES, INC.**  
1 Rossmoor Drive  
Unit B-3  
Monroe Twp., NJ 08831  
(609) 395-8700



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P.O. Box 19029  
Houston, Texas 77224-9029  
Phone (281) 588-3000

**SASOL**  
reaching new frontiers



## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### Potential Health Effects

#### EYES:

Irritation may occur with exposure to vapors. This liquid is a strong contact irritant. May cause corneal inflammation.

#### SKIN:

Repeated or prolonged contact can cause redness, irritation, and scaling of the skin (dermatitis). Normal care and personal hygiene should prevent skin effects.

#### INHALATION:

Irritation of the nose and throat, dizziness, and headache.

#### INGESTION:

Depression of central nervous system can occur. Aspiration (breathing) into lungs, caused while vomiting, may result in severe pulmonary injury.

(See Section 11 for Toxicological Information)

## 4. FIRST AID MEASURES

#### EYES:

Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention.

#### SKIN:

Remove contaminated clothing. Wash skin with soap and plenty of water. Get medical attention if symptoms occur. Wash clothing before reuse.

#### INHALATION:

Remove to fresh air. If not breathing, give artificial respiration and seek medical attention immediately. Oxygen should only be administered by trained personnel.

#### INGESTION:

If swallowed, call a physician immediately. ONLY induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.



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P.O. Box 19029  
Houston, Texas 77224-9029  
Phone (281) 588-3000



## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### 5. FIRE FIGHTING MEASURES

#### Flammable Properties

**FLASH POINT / METHOD:**

136 - 142 °F (58 - 61 °C) TAG CC

**AUTOIGNITION TEMPERATURE:**

555 °F (290 °C)

**FLAMMABLE LIMITS IN AIR % BY VOLUME:**

LOWER: Approximately 1.2

UPPER: Approximately 8.0

**FIRE AND EXPLOSION HAZARD:**

None expected. NFPA Class IIIA combustible liquid.

**EXTINGUISHING MEDIA:**

Water spray, fog or alcohol compatible foam is recommended.

**FIRE FIGHTING INSTRUCTIONS:**

Cool exposed equipment with water spray until well after fire is out. Self-contained breathing apparatus (SCBA) and structural firefighter's protective clothing will provide limited protection.

### 6. ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IN CASE OF SPILL OR LEAK:**

Evacuate the area and eliminate all sources of ignition. Contain the spill if possible. Dispose of only in accordance with local, state, and federal regulations.

**Small Spills:** Absorb with sand or other non-combustible absorbent material and place into containers for later disposal.

**Large Spills:** Dike far ahead of liquid spill for later disposal.

**CERCLA HAZARDOUS SUBSTANCE:**

Component

CERCLA RQ

Maximum Wt. %

Contains no chemicals on the CERCLA Hazardous Substance List.



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## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### 7. HANDLING AND STORAGE

#### ELECTROSTATIC ACCUMULATION HAZARD:

Precautions should be taken to prevent electrostatic discharge.

#### USUAL SHIPPING CONTAINERS:

Tank cars, tank trucks, and drums.

#### STORAGE / TRANSPORT TEMPERATURE:

Hot water system recommended for temperature control when storage is at temperatures below melting point.

#### STORAGE / TRANSPORT PRESSURE:

Ambient

#### LOAD / UNLOAD TEMPERATURE:

Ambient

#### STORAGE AND HANDLING MATERIALS:

**TANKS:** Carbon steel with effective moisture control, carbon steel coated with baked phenolic, fiberglass reinforced plastic with epoxy or polyester resin, or metallic zinc in an inorganic binder.

**NOTE:** Any moisture may cause rusting of carbon steel. Product contamination may result.

#### SPECIAL PRECAUTIONS:

Inert gas blanket and breathing system needed to maintain color stability. Use dry inert gas having at least -40°F dew point.

### 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

#### Engineering Controls

Mechanical ventilation may be necessary if working with the product in enclosed areas or at elevated temperatures.

#### Personal Protective Equipment

##### EYES:

When contact with liquid is possible, use a face shield. Otherwise use safety glasses with side shields or goggles.



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Houston, Texas 77224-9029  
Phone (281) 588-3000

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## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### SKIN:

Full protective clothing, chemical boots, and chemical gloves when contact with liquid is possible.

### RESPIRATORY PROTECTION:

Respiratory protection is normally not required except in emergencies or when conditions cause excessive airborne levels of mists or vapors. Select the appropriate NIOSH-approved organic vapor air-purifying respirator, self-contained breathing apparatus, or air-supplied respirators in situations where there may be potential for overexposure.

### Exposure Guidelines

#### Component

#### OSHA PEL

#### ACGIH TLV

None established.

PEL = Permissible Exposure Limits  
TLV = Threshold Limit Value  
EL = Excursion Limit

TWA = Time Weighted Average (8 hr.)  
STEL = Short Term Exposure Limit (15 min.)

### Carcinogenicity

No carcinogenic ingredients.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

#### APPEARANCE:

Colorless liquid.

#### VISCOSITY:

5.5 cSt @ 70°F/21°C

#### ODOR:

Sweet, pungent odor.

#### PHYSICAL STATE:

Liquid.

#### VAPOR PRESSURE (mm Hg.):

0.5 @ 70°F/21°C

#### BOILING POINT:

313 - 316°F (156 - 158°C)

#### VAPOR DENSITY (Air = 1):

4.5

#### MELTING POINT:

-49°F (-45°C)

#### SOLUBILITY IN WATER:

0.59 g/100g

#### SPECIFIC GRAVITY (H<sub>2</sub>O = 1):

0.820 @ 60/60°F





Sasol North America Inc.  
P.O. Box 19029  
Houston, Texas 77224-9029  
Phone (281) 588-3000



## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### 10. STABILITY AND REACTIVITY

**CONDITIONS TO AVOID:**

High temperatures.

**INCOMPATIBILITY WITH OTHER MATERIALS:**

Can react with strong oxidizers, inorganic acids, and halogens.

**HAZARDOUS DECOMPOSITION PRODUCTS:**

None expected.

**HAZARDOUS POLYMERIZATION:**

Should not occur.

### 11. TOXICOLOGICAL INFORMATION

**EYES:**

Primary Eye Irritation Index (Rabbits): 26.8 (unwashed), 32.6 (washed) at 24 hours; (Maximum score is 110). Irreversible corneal damage at day 3, the last day of observation.

**SKIN:**

Acute Dermal LD<sub>50</sub> (Rabbits): 1.5 - 2.3 g/kg.

Primary Skin Irritation Index (Rabbits): 5.1 (Maximum score is 8.0).

**INHALATION:**

No deaths in rats after 1 hour at 21 mg/l.

**INGESTION:**

Acute Oral LD<sub>50</sub> (Rat): 3.1 - 4.9 g/kg.

### 12. ECOLOGICAL INFORMATION

**ECOTOXICOLOGICAL INFORMATION:**

1-Hexanol toxicity to fathead minnows: 96h LC<sub>50</sub> = 97.2 mg/l.

**CHEMICAL FATE INFORMATION:**

1-Hexanol is biodegradable (1.2 g O<sub>2</sub> uptake/g hexanol in 7 days in river water).



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### 13. DISPOSAL CONSIDERATIONS

#### SPECIAL INSTRUCTIONS:

Dispose of in accordance with local, state, provincial and federal laws and regulations. Do not contaminate any lakes, streams, ponds, groundwater or soil.

#### WASTE CLASSIFICATION:

Liquids with a flash point below 140°F have the RCRA characteristic of ignitability, and are classed as hazardous for disposal purposes. This product should be evaluated at the time of disposal, since the product uses, transformations, and contamination that may occur during use may result in classification to a hazardous waste for reasons other than, and in addition to, ignitability.

#### EMPTY CONTAINERS:

Empty containers retain product residue (liquid and/or vapor) and can be dangerous. DO NOT PRESSURIZE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION; THEY MAY EXPLODE AND CAUSE INJURY OR DEATH. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner, or properly disposed of.

(See Section 6 for CERCLA Reporting Requirements)

### 14. TRANSPORT INFORMATION

#### DOT DESCRIPTION:

This product is regulated as a hazardous material as defined by the Department of Transportation.

PROPER SHIPPING NAME: Hexanols

HAZARD CLASS: 3

IDENTIFICATION NUMBER: UN 2282

PACKING GROUP: III

ADDITIONAL INFORMATION: Flash Point = 136 - 142°F (58 - 61°C)

#### ICAO / IATA DESCRIPTION:

This product is regulated as a dangerous good as defined by IATA for air transportation.

PROPER SHIPPING NAME: Hexanols

HAZARD CLASS: 3

UN NUMBER: UN 2282

PACKING GROUP: III



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## ALFOL® 6 ALCOHOL

MSDS CODE: ALF6  
REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### IMO DESCRIPTION (IMDG CODE):

This product is regulated as a dangerous good as defined by the IMDG Code for marine transport.

PROPER SHIPPING NAME: Hexanols  
HAZARD CLASS: 3  
UN NUMBER: UN 2282  
PACKING GROUP: III

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations

#### OSHA HAZARD COMMUNICATION STANDARD CLASSIFICATION:

Combustible liquid, eye and skin irritant as defined by the OSHA Hazard Communication Standard.

#### TSCA INVENTORY LISTING:

##### Component

##### CAS Number

1-Hexanol

111-27-3

#### SARA 302 STATUS:

##### Component

##### CAS Number

##### Maximum Wt. %

Contains no chemicals subject to SARA 302 reporting.

#### SARA 311/312 CLASSIFICATION:

SARA 311/312 "Immediate (acute) health hazard" and "Fire hazard".

#### SARA 313 CHEMICALS:

##### Component

##### CAS Number

##### Maximum Wt. %

Contains no chemicals subject to SARA 313 reporting.

(See Section 6 for CERCLA Reporting Requirements.)

### International Regulations

#### WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS) CLASSIFICATION:

Class B, Division 3: Combustible liquid.

Class D, Division 2, Subdivision B: Toxic material.



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## ALFOL® 6 ALCOHOL

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REVISION: 0702

REVISION DATE: 03/26/2003  
PRINT DATE: 05/02/03

### CANADIAN DOMESTIC SUBSTANCE LIST (DSL) INVENTORY LISTING:

Chemical Name

CAS Number

1-Hexanol

111-27-3

### EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS) LISTING:

Chemical Name

EINECS Number

1-Hexanol

2038523

### JAPANESE MINISTER OF INTERNATIONAL TRADE AND INDUSTRY (MITI) INVENTORY LISTING:

Chemical Name

Section Structure #

Alkanol (C<sub>5-38</sub>)

2-237

### AUSTRALIAN INVENTORY OF CHEMICAL SUBSTANCES (AICS) LISTING:

Chemical Name

CAS Number

1-Hexanol

111-27-3

### State Regulations

#### CALIFORNIA SAFE DRINKING WATER ACT (PROP 65) LISTING:

Component

CAS Number

\*\*No ingredients listed in this section\*\*

Based on current analytical information, this product contains no detectable quantities of chemicals on the California Proposition 65 list.

## 16. OTHER INFORMATION

Hazard Ratings

NFPA

HMIS

HEALTH:

1

2

FLAMMABILITY:

2

2

REACTIVITY:

0

0

### Revision Summary

Revised Sections 5 & 14.



010 05/13/05 ORTHOXYLENE

PRODUCT NAME: ORTHOXYLENE  
MSDS NUMBER: P16191VS  
DATE ISSUED: 01/10/2005  
SUPERSEDES: 12/31/2001  
ISSUED BY: 008562

\*\*\*\*\*  
\*\*\*\*\*

# MATERIAL SAFETY DATA SHEET

## 1 CHEMICAL PRODUCT & COMPANY IDENTIFICATION

TRADE NAME(S) ORTHOXYLENE  
CAS NUMBER 95-47-6  
PRODUCT CODE ND

SYNONYM(S):  
1,2-DIMETHYLBENZENE  
O-DIMETHYLBENZENE  
O-XYLENE  
O-METHYLTOLUENE  
1,2-XYLENE  
O-XYLOL

MANUFACTURER/SUPPLIER:  
Flint Hills Resources, LP, B.V., Pte Ltd. - Chemicals  
2825 Suntide Road (78409)  
P.O. Box 2608  
Corpus Christi, TX 78403  
TELEPHONE NUMBERS - 24 HOUR EMERGENCY ASSISTANCE  
Chemtrec 800-424-9300  
Flint Hills Resources, LP 361-241-4811  
TELEPHONE NUMBERS - GENERAL ASSISTANCE  
8-5 (M-F, CST) 800-835-1121  
8-5 (M-F, CST) MSDS 316-828-7988 Assistance

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient Name | CAS Number | Concentration* | Exposure Limits/<br>Health Hazards   |
|-----------------|------------|----------------|--|
| ORTHOXYLENE     | 95-47-6    | 99 - 100 %     | 100 ppm 8-Hour TWA (OSHA)<br>100 ppm 8-Hour TWA (ACGIH)<br>150 ppm 15-Min STEL (ACGIH) |
| METAXYLENE      | 108-38-3   | 0 - 1 %        | 100 ppm 8-Hour TWA (OSHA)<br>100 ppm 8-Hour TWA (ACGIH)<br>150 ppm 15-Min STEL (ACGIH) |
| CUMENE          | 98-82-8    | 0 - 0.3 To     | 50 ppm 8-Hour TWA (OSHA)<br>50 ppm 8-Hour TWA (ACGIH)                                  |
| PARAXYLENE      | 106-42-3   | 0 - 0.3 %      | 100 ppm 8-Hour TWA (OSHA)<br>100 ppm 8-Hour TWA (ACGIH)<br>150 ppm 15-Min STEL (ACGIH) |
| ETHYLBENZENE    | 100-41-4   | 0 - 0.1 %      | 100 ppm 8-Hour TWA (OSHA)<br>100 ppm 8-Hour TWA (ACGIH)<br>125 ppm 15-Min STEL (ACGIH) |
| TOLUENE         | 108-88-3   | 0 - 0.1 %      | 200 ppm 8-Hour TWA (OSHA)<br>300 ppm CEILING (OSHA)<br>50 ppm 8-Hour TWA (ACGIH)       |
| BENZENE         | 71-43-2    | 0 - 0.08 %     | 1 ppm 8-Hour TWA (OSHA)<br>5 ppm 15-Min STEL (OSHA)                                    |

## 1,3,5-TRIMETHYL-

|         |          |     |        |
|---------|----------|-----|--------|
| BENZENE | 108-67-8 | 0 - | 0.05 % |
| STYRENE | 100-42-5 | 0 - | 0.05 % |

|                             |
|-----------------------------|
| 0.5 ppm 8-Hour TWA (ACGIH)  |
| 2.5 ppm 15-Min STEL (ACGIH) |

|                             |
|-----------------------------|
| 25 ppm 8-Hour TWA (ACGIH)   |
| 420 mg/m3 8-Hour TWA (OSHA) |
| 85 mg/m3 8-Hour TWA (ACGIH) |

\*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

ND = No Data NA = Not Applicable

## COMPOSITION COMMENTS

\*\* Exposure to this chemical may add to the overall exposure, as it is readily absorbed through the skin.

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Flint Hills Resources, LP representative.

## 3 HAZARDS IDENTIFICATION EMERGENCY OVERVIEW WARNING!

## HEALTH HAZARDS

MAY BE HARMFUL IF SWALLOWED

ASPIRATION HAZARD IF SWALLOWED-CAN ENTER LUNGS AND CAUSE DAMAGE MAY CAUSE CARDIAC SENSITIZATION

OVEREXPOSURE MAY CAUSE CNS DEPRESSION

MAY BE IRRITATING TO THE SKIN, EYES AND RESPIRATORY TRACT POTENTIAL

REPRODUCTIVE HAZARD

DANGER-CONTAINS BENZENE-CANCER HAZARD

SEE TOXICOLOGICAL INFORMATION (SECTION 11) FOR MORE INFORMATION

## FLAMMABILITY HAZARDS FLAMMABLE

PER OSHA GUIDELINES, 29 CFR 1910.1200(c)

## REACTIVITY HAZARDS

STABLE

## POTENTIAL HEALTH EFFECTS, SKIN

SLIGHTLY TO MODERATELY IRRITATING. Contact may cause reddening, itching and inflammation.

Defatting agent. Repeated or prolonged contact may result in drying, reddening, itching, pain, inflammation, cracking and possible secondary infection with tissue damage.

No significant effects are expected to occur following short term exposure. Repeated or prolonged contact with large amounts of this material may result in absorption through the skin to produce toxic effects.

## POTENTIAL HEALTH EFFECTS, EYE

MODERATELY TO SEVERELY IRRITATING. Direct contact may cause pain, tears, burns, sensitivity to light, swelling and possible corneal damage.

Exposure to vapors, fumes or mists may cause irritation.

Prolonged or repeated exposure may cause irritation and conjunctivitis.

## POTENTIAL HEALTH EFFECTS, INHALATION

SLIGHTLY TOXIC. Breathing of the mists, vapors or fumes may irritate the nose, throat and lungs. Symptoms may include sore throat, coughing, labored breathing, sneezing and burning sensation, depending on the concentration

and duration of exposure.

May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

May cause cardiac sensitization, including arrhythmia (irregular heart beat) and death due to cardiac arrest.

Overexposure to this material may cause systemic damage including target organ effects listed under Toxicological Information (Section 11).

Other specific symptoms of exposure are listed under Toxicological Information (Section 11).

#### POTENTIAL HEALTH EFFECTS, INGESTION

MODERATELY TOXIC. May cause irritation of the mouth, throat and gastrointestinal tract. Symptoms may include salivation, pain, nausea, vomiting and diarrhea.

Aspiration into lungs may cause chemical pneumonia and lung damage.

Exposure may also cause central nervous system symptoms similar to those listed under Inhalation (see Inhalation section).

Overexposure to this material may cause systemic damage including target organ effects listed under Toxicological Information (Section 11).

Other specific symptoms of exposure are listed under Toxicological Information (Section 11).

#### 4 FIRST AID MEASURES

##### SKIN

Immediately wash skin with plenty of soap and water while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists.

Place contaminated clothing in closed container for storage until laundered or discarded. If clothing is to be laundered, inform person performing operation of contaminant's hazardous properties. Discard contaminated leather goods.

##### EYE

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get medical attention if irritation persists.

##### INHALATION

Safely remove the victim from exposure. DO NOT ATTEMPT TO RESCUE WITHOUT ADEQUATE PROTECTIVE GEAR AND PROPER TRAINING. Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen.

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

##### INGESTION

Do not induce vomiting because of danger of aspirating liquid into lungs, causing serious damage and chemical pneumonitis. If spontaneous vomiting occurs, keep head below hips to prevent aspiration and monitor for breathing difficulty. Gastric lavage should be performed only by qualified medical personnel.



Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

#### NOTES TO PHYSICIAN

Gastric lavage may be indicated if ingested. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for difficult breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

In cases of acute poisoning, artificial respiration with administration of oxygen may be useful for support. DO NOT GIVE EPINEPHRINE, EPHEDRINE OR SIMILAR ADRENERGIC DRUGS. THEY MAY INDUCE FATAL VENTRICULAR FIBRILLATION. Electrocardiographic monitoring should be carried out with severely ill patients to anticipate possible cardiac arrest.

Anemia may require the usual supportive measures. Medical evaluation of acute overexposure should include hematological determinations until stable. In severe acute and chronic poisoning, both renal and hepatic damage may occur and should be anticipated in such cases. Respiratory and pulmonary problems may require special attention. After severe acute symptoms have been alleviated, it may be advisable to consider periodic monitoring of the patient until such time as the likelihood of other adverse effects can be discounted.

#### 5 FIRE FIGHTING MEASURES

##### HAZARDOUS COMBUSTION PRODUCTS

Combustion may produce hazardous combustion products such as COx, NOx, and SOx.

##### EXTINGUISHING MEDIA

Use water spray, dry chemical, carbon dioxide or fire-fighting foam for Class B fires to extinguish fire.

##### BASIC FIRE FIGHTING PROCEDURES

Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor and to protect personnel attempting to stop a leak.

Use water spray to cool adjacent structures and to protect personnel. Shut off source of flow if possible. Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

##### UNUSUAL FIRE & EXPLOSION HAZARDS

Vapors may form explosive mixture with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat.

Flash Point 85 deg F (29 deg C) TAG CLOSED CUP

Autoignition Temperature 869 deg F (465 deg C)

Flammability Limits in Air, Lower, % by Volume 1 %

Flammability Limits in Air, Upper, % by Volume 6 0/0 6

#### 6. ACCIDENTAL RELEASE MEASURES

##### EMERGENCY ACTION



Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. Stay upwind. Isolate for 800 meters (1/2 mile) in all directions if tank, rail car or tank truck is involved in fire. Evacuate area endangered by release as required. (See Exposure Controls/Personal Protection, Section 8.)

#### ENVIRONMENTAL PRECAUTIONS

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If material is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released material. Notify local authorities and the National Response Center, if required.

#### SPILL OR LEAK PROCEDURE

Keep unnecessary people away. Isolate area for at least 50 to 100 meters (160 to 330 feet) to preserve public safety. For large spills, consider initial evacuation for at least 300 meters (1000 feet).

Keep ignition sources out of area and shut off all ignition sources. Absorb spill with inert material (e. g. dry sand or earth) then place in a chemical waste container. Large Spills: Dike far ahead of liquid spill for later disposal.

Use a vapor suppressing foam to reduce vapors. Stop leak when safe to do so. See Exposure Controls/Personal Protection (Section 8).

#### 7 HANDLING & STORAGE

##### HANDLING

Ground lines and equipment used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld or reuse containers unless adequate precautions are taken against these hazards.

Do not eat, drink or smoke in areas of use or storage.

##### STORAGE

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain material residue. Do not reuse without adequate precautions. Do not eat, drink or smoke in areas of use or storage.

#### 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

##### ENGINEERING CONTROLS

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

##### EYE PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Keep away from eyes. Eye contact can be avoided by using chemical safety glasses, goggles, and/or face shield. Have eye washing facilities readily available where eye contact can occur.

##### SKIN PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Additional protective clothing may be necessary.

Good personal hygiene practices such as properly handling contaminated clothing, using wash facilities before entering public areas and restricting

...eating, drinking and smoking to designated areas are essential for preventing personal chemical contamination.

#### RESPIRATORY PROTECTION: PERSONAL PROTECTION EQUIPMENT (PPE)

A NIOSH approved air purifying respirator with an appropriate cartridge or canister, such as an organic vapor cartridge, may be used in circumstances where airborne concentrations may exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

#### 9 PHYSICAL & CHEMICAL PROPERTIES ODOR AND APPEARANCE

CLEAR, COLORLESS LIQUID WITH A MODERATE, AROMATIC ODOR

Boiling Point 292 deg F (144 deg C)  
Specific Gravity 0.88 at 60/60 deg F (15.6/15.6 deg C)  
Melting Point -12 deg F (-24 deg C)  
Percent Volatile 100 %  
Vapor Pressure 7 mmHg at 68 deg F (20 deg C)  
Vapor Density 3.7  
Bulk Density ND  
Solubility in Water NEGLIGIBLE  
Octanol/Water Partn ND  
Volatile Organic ND  
Pour Point ND  
pH Value ESSENTIALLY NEUTRAL  
Freezing Point ND  
Viscosity ND  
Evaporation Rate SLOW RATE  
Molecular Formula C8H10  
Molecular Weight 106.1600  
Chemical Family AROMATIC HYDROCARBON  
Odor Threshold ND

#### 10 STABILITY & REACTIVITY

##### STABILITY/INCOMPATIBILITY

Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).

##### HAZARDOUS REACTIONS/DECOMPOSITION PRODUCTS

Combustion may produce COx, NOx, SOx, and other decomposition products in the case of incomplete combustion.

#### 11 TOXICOLOGICAL INFORMATION

##### ROUTES OF EXPOSURE

Inhalation, ingestion, skin and eye contact.

##### LD50

LD50 - (rat) 3523-4400 mg/kg

##### LC50

LC50 - (rat) 4740-6700 ppm

##### TOXICOLOGICAL DATA

Exposure to this material or its components may cause the following specific symptoms, depending on the concentration and duration of exposure: ringing in the ears, hearing loss, corneal vacuoles, paresthesia, vertigo, decreased peripheral nerve function, mucosal bleeding, enlarged liver and anemia.

Acute or chronic overexposure to this material or its components may cause systemic toxicity, including adverse effects to the following: skin, blood elements, liver, kidney, cardiovascular, nervous and respiratory system.

Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage (sometimes referred to as solvent or painter's syndrome). Intentional misuse by deliberately concentrating and inhaling this material may be harmful or fatal.

This material may contain benzene. Acute benzene poisoning causes central nervous system depression. Chronic exposure affects the hematopoietic system causing blood disorders including anemia and pancytopenia.

#### CARCINOGENICITY

This material may contain benzene. Benzene is carcinogenic to laboratory animals when given by intubation or by inhalation. There is an association between occupational exposure to benzene and human leukemia. Carcinogenic determinations: IARC human positive and animal suspected carcinogen (IARC Class 1); NTP known carcinogen; ACGIH suspected carcinogen; OSHA carcinogen.

This material may contain ethylbenzene. IARC has determined that there is sufficient evidence for the carcinogenicity of ethylbenzene in experimental animals and inadequate evidence for the carcinogenicity of ethylbenzene in humans. (IARC Class 2B)

#### TERATOGENICITY, MUTAGENICITY, OTHER REPRODUCTIVE EFFECTS

This material contains xylenes which may cause adverse reproductive and/or developmental effects. These effects appear to occur at doses that are maternally toxic.

This material may contain benzene. Mutagenic and clastogenic in mammalian and non-mammalian test systems. Reproductive or developmental toxicant only at doses that are maternally toxic, based on tests with animals.

Pregnant women may be at an increased risk from exposure.

Consumption of alcoholic beverages may enhance toxic effects.

#### PRE-EXISTING CONDITIONS AGGRAVATED BY EXPOSURE

Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin, liver, kidney, blood, respiratory, cardiovascular and nervous system.

#### SYNERGISTIC MATERIALS

ND

#### 12 ECOLOGICAL INFORMATION

##### ECOTOXICOLOGICAL INFORMATION

This material contains orthoxylene which biodegrades in soil and water and oxidizes in air. This material is not expected to bioaccumulate in aquatic organisms.

#### 13 DISPOSAL CONSIDERATIONS

##### WASTE DISPOSAL

This material, as supplied, when discarded or disposed of, is a U239 listed hazardous waste according to Federal Regulations 40 CFR 261.33(f) due to its ignitability, and a characteristic hazardous waste due to its ignitability and benzene content as defined in Subpart C of 40 CFR 261. Additionally, pursuant to 40 CFR 261.33(d) and (e), any residue remaining in a container

that has held this material and any residue or contaminated soil, water or other debris resulting from the cleanup of a spill of this material is also a listed hazardous waste. Under RCRA, it is the responsibility of the user of the material to determine, at the time of disposal, whether the material meets RCRA criteria for hazardous waste.

The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with 40 CFR 262, 263, 264, 268 and 270. Disposal can occur only in properly permitted facilities. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

#### 14 TRANSPORT INFORMATION

BILL OF LADING - BULK (U. S. DOT)  
Xylenes, (Orthoxylene), 3, UN1307, PG III, RQ

BILL OF LADING - NON-BULK (U. S. DOT)  
Xylenes, (Orthoxylene), 3, UN1307, PG III

U. S. Department of Transportation (DOT) Requirements

General Transportation Information for Bulk Shipments

Proper Shipping Name Xylenes, (Orthoxylene)  
Hazard Class 3 UN/NA Code UN1307  
Packaging Group PG III  
Labels Required Flammable Liquid  
Placards Required Flammable Liquid, UN1307  
Reportable Quantity See Regulatory Information (Section 15)

General Transportation Information for Non-Bulk Shipments

Proper Shipping Name Xylenes, (Orthoxylene)  
Hazard Class 3 UN/NA Code UN1307  
Packaging Group PG III  
Labels Required Flammable Liquid  
Placards Required Flammable Liquid, UN1307  
Reportable Quantity See Regulatory Information (Section 15)

#### COMMENTS

The above description may not cover shipping in all cases, please consult 49 CFR 100-185 for specific shipping information.

#### 15 REGULATORY INFORMATION

##### FEDERAL REGULATIONS

All ingredients are on the TSCA inventory, or are not required to be listed on the TSCA inventory.

Consult OSHA's Benzene standard 29 CFR 1910.1028 for provisions on air monitoring, employee training, medical monitoring, etc.

This material may be subject to export notification under TSCA section 12(b); contains: Paraxylene (CAS # 106-42-3) Effective Date 5/26/04.

This material, as supplied, contains benzene, paraxylene, styrene, orthoxylene, metaxylene, toluene, ethylbenzene, and cumene, which are CERCLA Hazardous Substances as per 40 CFR Part 302.4, and is therefore subject to the release reporting requirements of CERCLA. The reportable quantities for benzene, paraxylene, styrene, orthoxylene, metaxylene, toluene, ethylbenzene, and cumene, are 10, 100, 1000, 1000, 1000, 1000, 1000, and

5000 pound(s), respectively.

This material contains toxic chemical(s) in excess of the applicable de minimis concentration that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372). This information must be included in all MSDSs that are copied and distributed for this material.

This material contains up to 100% volatile organic compounds (VOCs) per 40 CFR Part 51.100. This material contains up to 100% hazardous air pollutants (HAPs) per Section 112 Clean Air Act Amendments of 1990.

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

#### STATE REGULATIONS

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

This material, as sold, meets the requirements of the Model Toxics Legislation of the Coalition of Northeastern Governors (CONEG). Any alteration of this material may affect its compliance with this law.

#### SARA 311/312 HAZARD CATEGORIES

Immediate Hazard: X Delayed Hazard: X Fire Hazard: X Pressure Hazard: X  
Reactivity Hazard: X

#### NFPA RATINGS

Health 2 Flammability 3 Reactivity 0 Special Hazards

#### HMIS RATINGS

Health 2\* Flammability 3 Reactivity 0

Following ingredients of this material are listed in SARA 313 above the de minimis concentration

| SARA Listed Ingredient Name | CAS Number | Maximum % |
|-----------------------------|------------|-----------|
| ORTHOXYLENE                 | 95-47-6    | 100.0     |
| METAXYLENE                  | 108-38-3   | 1.0       |

#### ----- FOR ADDITIONAL INFORMATION -----

CONTACT: MSDS COORDINATOR UNIVAR USA INC.  
DURING BUSINESS HOURS, PACIFIC TIME (425) 889-3400

#### ----- NOTICE -----

\*\*\*\*\* UNIVAR USA INC ("UNIVAR") EXPRESSLY DISCLAIMS

ALL EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A

PARTICULAR PURPOSE, WITH RESPECT TO THE PRODUCT OR INFORMATION PROVIDED HEREIN,

AND SHALL UNDER NO CIRCUMSTANCES BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. \*\*

DO NOT USE INGREDIENT INFORMATION AND/OR INGREDIENT PERCENTAGES IN THIS MSDS AS A PRODUCT SPECIFICATION. FOR PRODUCT SPECIFICATION INFORMATION REFER TO A



PRODUCT SPECIFICATION SHEET AND/OR A CERTIFICATE OF ANALYSIS. THESE CAN BE OBTAINED FROM YOUR LOCAL UNIVAR SALES OFFICE.

ALL INFORMATION APPEARING HEREIN IS BASED UPON DATA OBTAINED FROM THE MANUFACTURER AND/OR RECOGNIZED TECHNICAL SOURCES. WHILE THE INFORMATION IS BELIEVED TO BE ACCURATE, UNIVAR MAKES NO REPRESENTATIONS AS TO ITS ACCURACY OR SUFFICIENCY. CONDITIONS OF USE ARE BEYOND UNIVARS CONTROL AND THEREFORE USERS ARE RESPONSIBLE TO VERIFY THIS DATA UNDER THEIR OWN OPERATING CONDITIONS TO DETERMINE WHETHER THE PRODUCT IS SUITABLE FOR THEIR PARTICULAR PURPOSES AND THEY ASSUME ALL RISKS OF THEIR USE, HANDLING, AND DISPOSAL OF THE PRODUCT, OR FROM THE PUBLICATION OR USE OF, OR RELIANCE UPON, INFORMATION CONTAINED HEREIN. THIS INFORMATION RELATES ONLY TO THE PRODUCT DESIGNATED HEREIN, AND DOES NOT RELATE TO ITS USE IN COMBINATION WITH ANY OTHER MATERIAL OR IN ANY OTHER PROCESS.

\* \* \* E N D O F M S D S \* \* \*

RESPONSE TO ALLEGED NOV<sub>s</sub>  
& IRLs

ATTACHMENT 15

Copies of RCRA Waste Analyses for Select  
Waste Streams

Elan Chemical Company, Inc.  
Newark, NJ



## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/12/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         | DELIVERY TO LAB |             |
|---------|----------|------|---------|-----------------|-------------|
| LAB No. | DATE     | TIME | SAMPLER | DATE            | TIME MATRIX |
| 67461   | 02/23/99 | 0900 | CLIENT  | 02/23/99        | 1130 SO     |

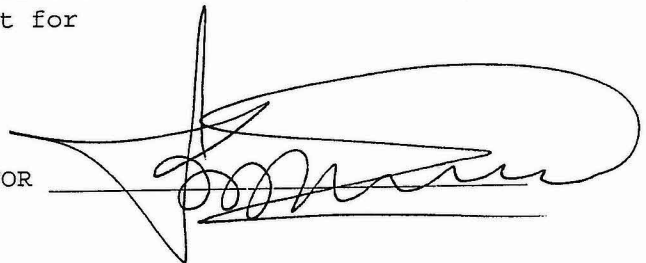
CLIENT STATION ID: EM4677  
LAB #: 67461

| TCLP EXTRACTION (METALS/BNA) |          | COMPLETE |
|------------------------------|----------|----------|
| TCLP SEMI-VOA'S.....         |          | R. A.    |
| TCLP VOA'S.....              |          | R. A.    |
| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure ttest for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR



2/23/99

EMP6 Residue

## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/12/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         |
|---------|----------|------|---------|
| LAB No. | DATE     | TIME | SAMPLER |
| 67461   | 02/23/99 | 0900 | CLIENT  |

| DELIVERY TO LAB |             |
|-----------------|-------------|
| DATE            | TIME MATRIX |
| 02/23/99        | 1130 SO     |

CLIENT STATION ID: EM4677  
LAB #: 67461

| TCLP EXTRACTION (METALS/BNA) |          | COMPLETE |
|------------------------------|----------|----------|
| TCLP SEMI-VOA'S.....         |          | R. A.    |
| TCLP VOA'S.....              |          | R. A.    |
| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure ttest for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR

## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/10/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         | DELIVERY TO LAB |             |
|---------|----------|------|---------|-----------------|-------------|
| LAB No. | DATE     | TIME | SAMPLER | DATE            | TIME MATRIX |
| 67461   | 02/23/99 | 0900 | CLIENT  | 02/23/99        | 1130 SO     |

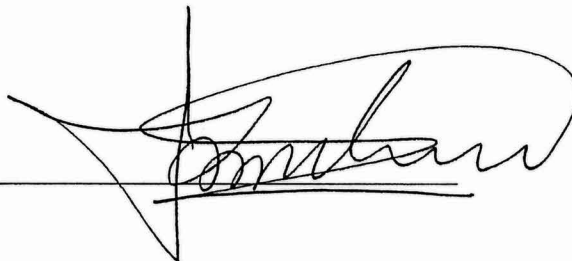
CLIENT STATION ID: EM4677  
LAB #: 67461

|                              |          |          |
|------------------------------|----------|----------|
| TCLP EXTRACTION (METALS/BNA) |          | COMPLETE |
| TCLP SEMI-VOA'S.....         |          | R. A.    |
| TCLP VOA'S.....              |          | R. A.    |
| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

PROJECT NAME: EM4677

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR



Lab Name: CHEMTECH

Contract: ELAN CHEMICAL

EM4677

Project No.: 10855C

Site:

Location:

Group:

Matrix: (soil/water) WATER

Lab Sample ID: O67461

Sample wt/vol: 1.0 (g/mL) ML

Lab File ID: V5380.D

Level: (low/med)

Date Received: 2/23/99

|             |          |     |
|-------------|----------|-----|
| % Moisture: | not dec. | 100 |
|-------------|----------|-----|

Date Analyzed: 2/25/99

GC Column: RTX624

ID: 0.53 (mm)

Dilution Factor: 1.0

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Concentration Units:

(ug/L or ug/Kg)      ug/L

Q

[illegible]



## CHAIN OF CUSTODY RECORD

North Jersey  
110 Route 4  
Englewood, NJ 07631  
(201) 567-6868 Fax (201) 567-1333

South Jersey  
512 Route 9 South  
Forked River, NJ 08731  
(609) 693-2111 Fax (609) 971-9300

CHEMTECH JOB NO.:

CHEMTECH QUOTE NO.:

### CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: ELAN Chemical  
ADDRESS: 268 Doremus Ave  
CITY: Newark STATE: NJ ZIP: 07105  
ATTENTION: Jocelyn KAPMANSHIP  
PHONE: 973 344 8014 FAX: 973 344 1948

### PROJECT INFORMATION

PROJECT NAME: EM4677  
PROJECT NO.: +  
PROJECT MANAGER:  
LOCATION:  
PHONE: FAX:

### BILLING INFORMATION

BILL TO: ELAN Chem PO #: 22457  
ADDRESS: 268 Doremus Ave  
CITY: Newark STATE: NJ ZIP: 07105  
ATTENTION: PHONE:

### DATA TURNAROUND INFORMATION

☐ 21 DAYS ☐ 14 DAYS ☐ 7 DAYS ☐ OTHER  
APPROVED BY:  
21 DAY TURNAROUND HARDCOPY, EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED.

### DATA DELIVERABLE INFORMATION

☐ NJ REDUCED ☐ CHEMTECH FORMAT  
☐ NJ CLP ☐ RESULTS ONLY  
☐ USEPA CLP ☐ DISKETTES  
☐ NYS CLP ☐ NYS ASP  
☐ OTHER

### ANALYSIS

1 TELP/VOA  
2 TELP/BNA Metals  
3 TELP/React.  
4  
5  
6  
7  
8  
9  
BOD/TSS

| CHEMTECH<br>SAMPLE<br>ID | SAMPLE IDENTIFICATION | SAMPLE<br>MATRIX | SAMPLE<br>TYPE |      | SAMPLE<br>COLLECTION |      | # OF BOTTLES | PRESERVATIVES |   |  |  |   |  |  |  | COMMENTS |
|--------------------------|-----------------------|------------------|----------------|------|----------------------|------|--------------|---------------|---|--|--|---|--|--|--|----------|
|                          |                       |                  | COMP           | GRAB | DATE                 | TIME |              |               |   |  |  |   |  |  |  |          |
| 1.                       | EM4677                |                  | X              |      | 2/23                 | 9AM  | 2            | 1             | 1 |  |  |   |  |  |  |          |
| 2.                       | M175                  |                  | X              |      | 2/23                 | 8AM  | 1            |               |   |  |  | X |  |  |  |          |
| 3.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |
| 4.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |
| 5.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |
| 6.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |
| 7.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |
| 8.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

|   |                               |   |   |
|---|-------------------------------|---|---|
| RELINQUISHED BY SAMPLER:<br>1. <u>[Signature]</u> | DATE/TIME:<br><u>2/23 9AM</u> | RECEIVED BY:<br>1. <u>[Signature]</u>         | Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler <u>5°C</u><br>Comments: |
| RELINQUISHED BY:<br>2. <u>[Signature]</u>         | DATE/TIME:                    | RECEIVED BY:<br>2.                            |   |
| RELINQUISHED BY:<br>3.                            | DATE/TIME:<br><u>2/23/99</u>  | RECEIVED FOR LAB BY:<br>3. <u>[Signature]</u> |   |

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

No 020724

## DATA REPORTING QUALIFIERS - ORGANIC

For reporting results, the following "Results Qualifiers" are used:

**VALUE -** If the result is a value greater than or equal to the detection limit, report the value.

**U -** Indicates the compound was analyzed for, but was not detected. Report the minimum detection limit for the sample with the U, ie "10 U". This is not necessarily the instrument detection limit. The figure represents the minimum detection limit attainable for this particular sample based on any concentration or dilution that may have been required.

**J -** Indicates an estimated value. This flag is used:

- (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed).
- (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit but greater than zero. If the detection limit was 10 ug/L and a concentration of 3 ug/L was calculated, report as "3 J".

**B -** Indicates the analyte was found in the blank as well as the sample; report as "12 B".

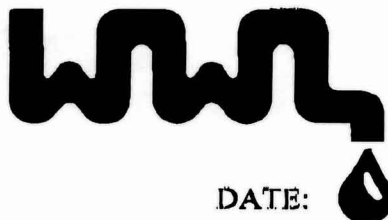
**E -** Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.

**D -** This flag identifies all compounds identified in an analysis at a secondary dilution factor.

**P -** This flag is used for a Pesticide/Aroclor target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".

**N -** This flag indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.



**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
(973) 678-3787 FAX (973) 678-8779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: NAT RSTD CASSIA OIL

SAMPLE NUMBER: 182000

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 6       |
| FLASHPOINT Deg F |     | >180    |

---

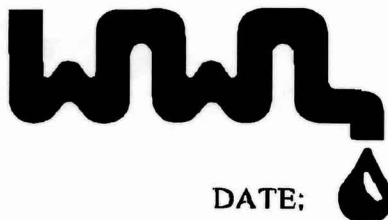
All Results Reported As ppm

MDL = Method Detection Limit

ND = Not Detected Above MDL

NJDEP LABORATORY ID # 07673

W.W.L.'S TOTAL LIABILITY FOR ANY WORK PERFORMED IS LIMITED TO THE COST OF SERVICES RENDERED

**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
(973) 678-3787 FAX (973) 678-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: 1,2 HEXANE DIUL

SAMPLE NUMBER: 182001

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 8       |
| FLASHPOINT Deg F |     | >180    |

---

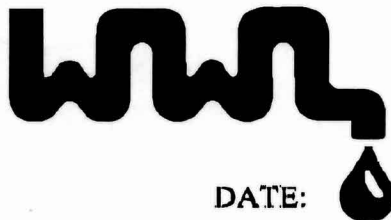
All Results Reported As ppm

MDL = Method Detection Limit

ND = Not Detected Above MDL

NJDEP LABORATORY ID # 07673

W.W.L.'S TOTAL LIABILITY FOR ANY WORK PERFORMED IS LIMITED TO THE COST OF SERVICES RENDERED

**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
[973] 878-3787 FAX [973] 878-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: ETHYL CINNAMATE

SAMPLE NUMBER: 182002

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 6       |
| FLASHPOINT Deg F |     | >180    |

---

All Results Reported As ppm

MDL = Method Detection Limit

ND = Not Detected Above MDL

NJDEP LABORATORY ID # 07673

W.W.L.'S TOTAL LIABILITY FOR ANY WORK PERFORMED IS LIMITED TO THE COST OF SERVICES RENDERED



268 DOREMUS AVENUE  
NEWARK, NJ 07105  
(973) 344-8014  
FAX (973) 344-1948  
www.elan-chemical.com  
EMAIL sales@elan-chemical.com

July 18, 2006

## pH Analysis of Compound SB

|                              |      |
|------------------------------|------|
| 1,2 Hexanediol residue ..... | 7.65 |
| NRCO residue .....           | 9.40 |

A handwritten signature in cursive script that reads "Robert Fiscina". The signature is written in dark ink and is positioned above a horizontal line.

Robert Fiscina  
Quality Control Manager



3/20 received  
INCORPORATED 268 DOREMUS AVE. NEWARK, N.J. 07105 (201) 344-8014

FAX: (201) 344-1948

March 18, 1996

USEPA  
Region II  
290 Broadway 22<sup>nd</sup> Floor  
New York, NY 10007-1866  
Attn.: Jessica Gottlieb

Re: NOTICE OF VIOLATION from February 21, 1996

Dear Ms. Gottlieb,

In response to the notice we have taken the following corrective actions:

1. We are scheduling an emergency response drill for the second half of April of 1996 where the local Police and Fire departments will be present.
2. We have switched back to using a 55 Gallon drum in our Satellite Accumulation area.
3. The drum in the Satellite Accumulation is kept tightly closed, except at the time of filling.
4. Correct labels have been provided to the production staff to use on the Hazardous Waste containers.
5. The log was not filled at the time of inspection because the person responsible for keeping the log was on vacation. We have designated a backup person who will keep the log during such future occasions.

Sincerely,

A handwritten signature in cursive script, appearing to read "Yury Langer".  
Yury Langer  
Environmental & Safety Manager

## API 653 Monthly Inspection - Storage Tanks

Inspection Instructions: Routine monthly in-service inspections under API 653 requires tank owner/operators to conduct a close visual inspection from the ground of the exterior surface of each storage tank. Inspectors must be knowledgeable of the storage facility operations, the tank, and the characteristics of the product stored. Check each of the inspection items listed and date and initial where indicated. Note any inspection deficiencies below and initiate corrective actions as necessary.

Tank No.: 78-Haz. Waste

Inspection Year: 2006

Reference Standard: API 653 Sec. 4.3.1

| Inspection Item                | JAN. |         | FEB. |         | MARCH |         | APRIL |         | MAY  |         | JUNE |         | JULY |         | AUG. |         | SEPT. |         | OCT. |         | NOV. |         | DEC. |         |
|--------------------------------|------|---------|------|---------|-------|---------|-------|---------|------|---------|------|---------|------|---------|------|---------|-------|---------|------|---------|------|---------|------|---------|
|                                | Date | Initial | Date | Initial | Date  | Initial | Date  | Initial | Date | Initial | Date | Initial | Date | Initial | Date | Initial | Date  | Initial | Date | Initial | Date | Initial | Date | Initial |
| 1. Signs of Leaks              |      |         | 2/4  | ELS     | 3/14  | ELS     | 4/3   | ELS     |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 2. Signs of Shell Distortions  |      |         | 1    | ELS     | 1     | ELS     | 1     | ELS     |      |         | 1    |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 3. Signs of Settlement         |      |         | 1    | ELS     | 1     | ELS     | 1     | ELS     |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 4. Signs of Corrosion          |      |         | 1    | ELS     | 1     | ELS     | 1     | ELS     |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 5. Condition of Foundation     |      |         | 1    | ELS     | 1     | ELS     | 1     | ELS     |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 6. Condition of Paint Coatings |      |         | 1    | ELS     | X     |         | X     |         |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |
| 7. Condition of Appurtenances  |      |         | 1    | ELS     | 1     | ELS     | 1     | ELS     |      |         |      |         |      |         |      |         |       |         |      |         |      |         |      |         |

| DEFICIENCIES NOTED |                  |  |  |  | CORRECTIVE ACTIONS IMPLEMENTED |               |  |  |  |
|--------------------|------------------|--|--|--|--------------------------------|---------------|--|--|--|
| Inspection Date    | Description      |  |  |  | Date Completed                 | Actions Taken |  |  |  |
| 3/14               | Needs Repainting |  |  |  |                                |               |  |  |  |
|                    |                  |  |  |  |                                |               |  |  |  |
|                    |                  |  |  |  |                                |               |  |  |  |

\*  
TK#78 Hazardous Waste

The rate of Corrosion is;

Bottom

$$CR = \frac{437 - 395}{5} = \frac{.042}{5} = .0084 \text{ per yr}$$

Middle

$$CR = \frac{357 - 329}{5} = \frac{.028}{5} = .0056$$

Top

$$CR = \frac{425 - 410}{5} = \frac{.015}{5} = .003$$

Between the years of 3/11/97  
and 12/27/02



# STORAGE TANK INSPECTION

## Type I

**Date:** 12/27/02

**By:** Eddie Kearney Jr

**Tank #:** 78

**Location:** East TK Farm

**Contents:** Haz. Waste

**Approx. Capacity :** 12,000 gals.

**Dimensions :** 8ft dia. x 24ft high.

**Material of construction :** Steel

**Exterior color & condition:** White/poor

**Vent Type:** Atmospheric

**Physical condition of tank:** good

**Notes:**

Needs painting

# **STORAGE TANK INSPECTION**

## **Type II**

**Date:** 12/27/02

**By:** Eddie Kearney Jr

**Tank #:** 78

**Location:** East TK Farm

**Empty Date** 12/17/02

**Clean Date** 12/24/02 **Internal Visual Inspection** yes **no**

Internal visual Inspection done on 12/26/02  
with

**Physical condition of tank:** Good

**Acoustic Emission Testing Results:** No change in db  
when hammer test of bottom done

**Notes:**

Needs exterior painted

## STATIC HEAD AST TEST

TANK #: 78

PRODUCT IN TANK: Haz. Waste

NOTE: - isolate tank

- take readings over a 24 hour period
- fill tank to 75% of its capacity

|             |          |       |          |       |     |        |      |
|-------------|----------|-------|----------|-------|-----|--------|------|
| START DATE: | 12/27/02 | TIME: | 8:45 Am  | TEMP: | 29° | LEVEL: | 200" |
|             |          | TIME: | 9:45 Am  | TEMP: | 30° | LEVEL: | 200" |
|             |          | TIME: | 11:45 Am | TEMP: | 30° | LEVEL: | 200" |
|             |          | TIME: | 1:45 pm  | TEMP: | 30° | LEVEL: | 200" |
|             |          | TIME: | 2:45 pm  | TEMP: | 30° | LEVEL: | 200" |
|             | 12/30/02 | TIME: | 9:00 Am  | TEMP: | 34° | LEVEL: | 200" |
|             |          | TIME: | 10:30 Am | TEMP: | 34° | LEVEL: | 200" |
|             |          | TIME: | 11:30 Am | TEMP: | 40° | LEVEL: | 200" |
|             |          | TIME: | 1:00 pm  | TEMP: | 40° | LEVEL: | 200" |
|             |          | TIME: | 1:45 pm  | TEMP: | 40° | LEVEL: | 200" |
| END DATE:   | 12/30/02 | TIME: | 2:30 pm  | TEMP: | 40° | LEVEL: | 200" |

NOTES:

INSPECTOR

Edi Kearney Jr

## INTERNAL VISUAL INSPECTION

|          |            |
|----------|------------|
| Date:    | 12/27/02   |
| Tank#:   | 78         |
| CAS#:    | 64742-48-9 |
| Product: | Haz Waste  |

| Overview  | Completed | Comments                           |
|---|-----------|------------------------------------|
| a. Check that tank has been cleaned, is gas free, and safe for entry.   | X         | listed on type II sheet<br>tag out |
| b. Check that the tank is completely isolated from product lines, all electrical power, and steam lines.                                      | X         |                                    |
| c. Check that roof is adequately supported.   | X         | No supports - dome type            |
| d. Inspect for slipping hazard on the bottom and roof decks.  | X         |                                    |
| e. Inspect structural welds on access ways and clips.   | X         |                                    |
| f. Inspect appurtenances opened during cleaning such as lower floating swing sheave assemblies, nozzle interiors.                             | X         |                                    |
| <b>Bottom Interior Surface</b>  |           |                                    |
| a. Measure the depth of pitting and describe its appearance. (sharp edge, lake type, dense, scattered, etc.)                                  | X         | no pitting noticed                 |
| b. Mark areas requiring patching or further inspection.   | X         | no patching required               |
| c. Inspect all welds for corrosion and leaks, particularly the shell to bottom weld.  | X         |                                    |
| d. Inspect sketch plates for corrosion.   | X         |                                    |
| e. Record bottom data on a layout sketch using the existing bottom plates as a grid. List the number and sizes of patches required.           | X         | no patching required               |
| f. Check for reinforcing pads under all bottom attached clips, brackets, and supports.  | X         |                                    |
| g. Identify low areas on the bottom that do not drain adequately.   | X         | upside-down type dome              |
| <b>Shell Mounted Overflows</b>  |           |                                    |
| a. Inspect overflow for corrosion and adequate screening.   | X         | high level alarm                   |
| b. Check location of overflow that it is not above any tank valve/equip.  | X         |                                    |
| <b>Roof Interior Surface</b>  |           |                                    |
| a. Visually inspect the underside surface of the roof plates for holes, scale buildup, and pitting.   | X         |                                    |
| b. Check all clips, brackets, braces, etc., welded to the roof deck plate for welded reinforcing pads and see that they have not broken free. | X         | no roof deck plate                 |
| c. If no pad is present, penetrant test for cracking of the weld/deck plate.  | X         |                                    |
| d. Inspect and gauge rafters for thinning, particularly near the center of the roof. Report metal loss.                                       | X         |                                    |
| e. Check for loose or twisted rafters.  | X         |                                    |
| <b>Fixed Roof Appurtenances</b>   |           |                                    |
| a. Inspect hatches for corrosion, paint and coating failure, holes, and cover sealing.  | X         |                                    |
| b. Inspect the condition of the gaskets on bolt or latched down hatch covers.   | X         |                                    |
| c. Inspect and service the breathers.   | X         |                                    |
| d. Inspect screens on vents and breathers.  | X         | Atmospheric                        |
| <b>Floating Roof Appurtenances</b>  |           |                                    |
| a. Hammer test fixed drain line on tank bottom for thinning and scale debris plugging.  | N/A       |                                    |
| b. Inspect drain line supports and reinforcing pads for weld failures & corrosion.  |           |                                    |
| c. Overfill alarm: Inspect overfill prevention alarm for proper operation.  |           |                                    |
| <b>Common Tank Appurtenances</b>  |           |                                    |
| a. Check for corrosion on the pipe joint. Check that sample cords, weights, thermometers, etc., have been removed from the pipe.              | X         |                                    |

|  | Completed | Comments              |
|--|-----------|-----------------------|
| b. Identify and report size and pipe schedule of the gauge well.   | X         | on tank drawing       |
| c. Inspect shell nozzle for thinning and pitting.  | X         |                       |
| d. Inspect hot tap nozzles for trimming of holes.  | X         |                       |
| e. Identify type of shell nozzles.   | X         | shown on tank drawing |
| f. Inspect pipe support pads welded to tank bottom for nozzles extending into tank.  | X         | nozzles flush mount   |
| g. Inspect bottom and shell plates and deflector stands.   | X         |                       |
| h. Inspect for corrosion and erosion on the wear plates. Inspect for rigidity, structural soundness, corrosion, and erosion of deck plates and reinforcing pads that are seal welded to the bottom under the deflector stand legs. | X         |                       |
| Access Structures  |           |                       |
| a. Identify and report type of handrails (steel pipe, galvanized pipe, angle).   | N/A       |                       |
| b. Inspect handrails for pitting and holes, paint failure.   |           |                       |
| c. Inspect handrail's attachment welds.  |           |                       |
| d. Inspect platform frame for thinning and holes.  |           |                       |

# STORAGE TANK INSPECTION

Date: 3/12/02

By: Eddie Kearney Jr

Tank #: 78

Location: East TK Farm

Contents: Hazardous Waste

Approx. Capacity: 12,000 gals.

Dimensions: 8' dia. x 24' high.

Material of construction: Steel

Exterior color & condition: White / very poor

Vent type: Atmospheric / Flame arrestor

Physical condition of tank: good

## Notes:

Need to be painted

# STORAGE TANK INSPECTION

Date: 3/12/02

By: Eddie Kearney Jr

Tank #: 78

Location: East TK Farm

Contents: Hazardous Waste

Approx. Capacity: 12,000 gals.

Dimensions: 8' dia. x 24' high.

Material of construction: Steel

Exterior color & condition: White / very poor

Vent type: Atmospheric / Flame arrestor

Physical condition of tank: good

## Notes:

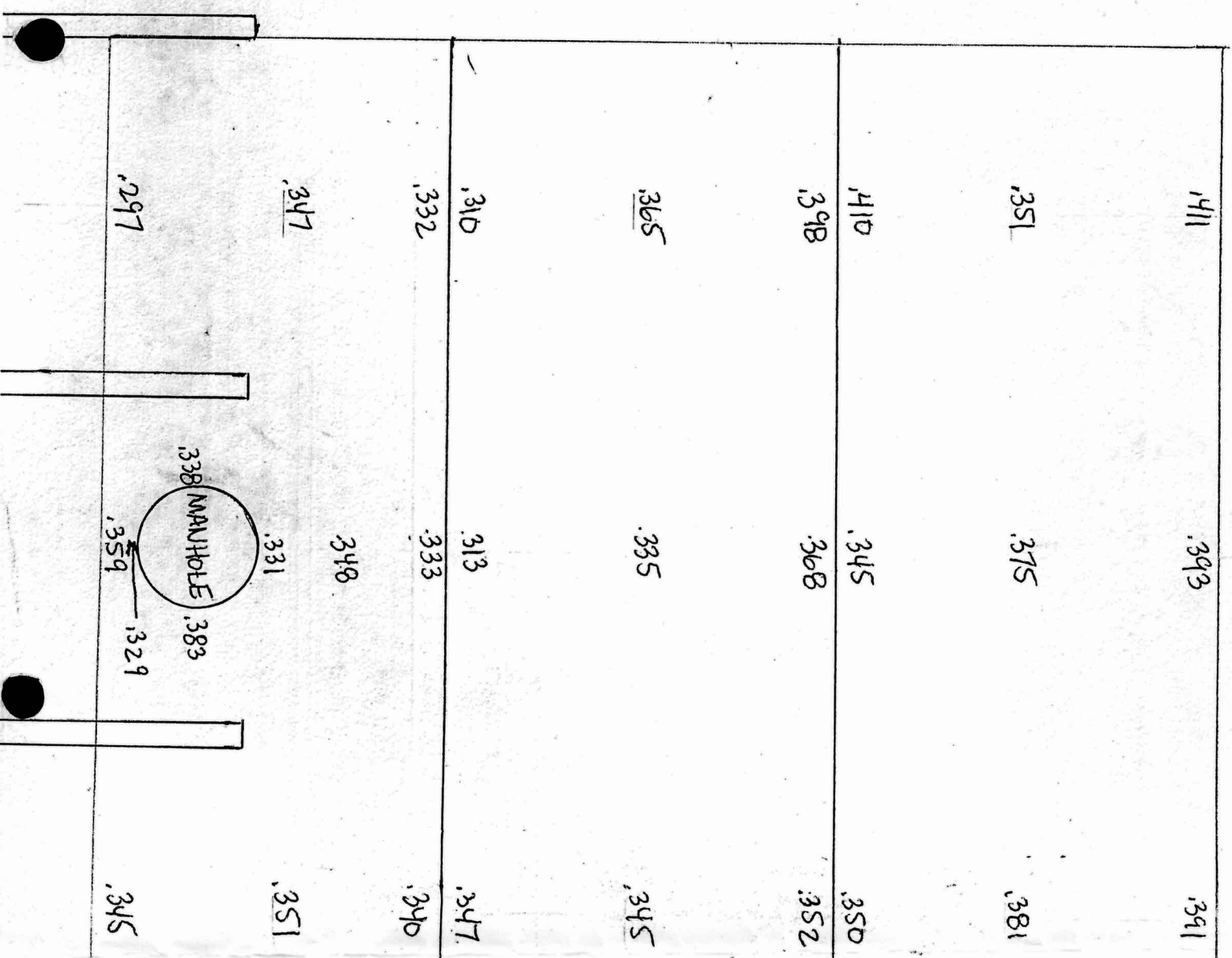
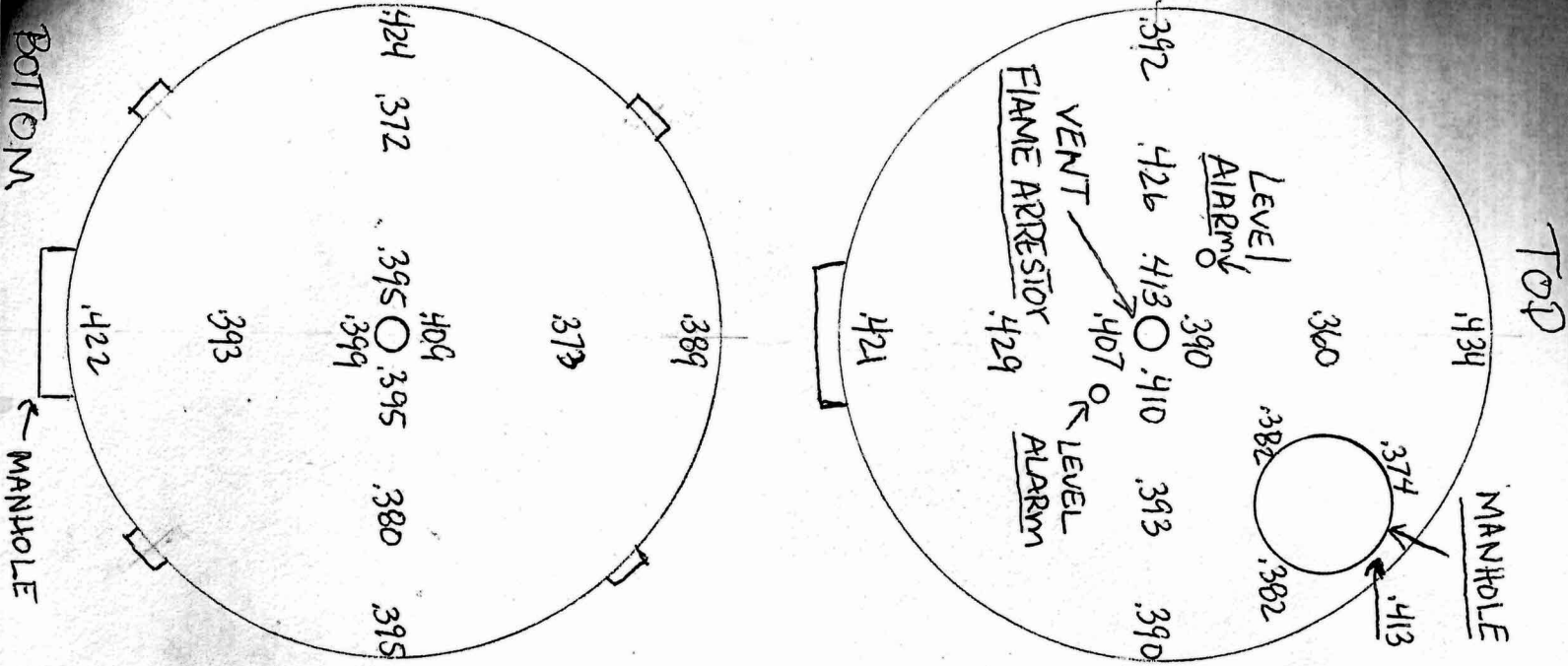
Need to be painted



|                            |   |  |  |  |  |
|----------------------------|---|--|--|--|--|
| <b>Contents</b>            | Hazardous Waste   |  |  |  |  |
| <b>Volumetric Capacity</b> | 10,000 Gallons  |  |  |  |  |
| <b>Location</b>            | Outside-East Tank Farm  |  |  |  |  |
| <b>Dimensions</b>          | 25.2' Height  |  |  |  |  |
|                            | 8.5' Diameter   |  |  |  |  |
|                            | 26.3' Circumference   |  |  |  |  |
| <b>Construction</b>        | Carbon Steel  |  |  |  |  |
| <b>Spill Containment</b>   | Adequate  |  |  |  |  |
| <b>Exterior</b>            | Painted White   |  |  |  |  |
| <b>Overflow</b>            | no  |  |  |  |  |
| <b>Leakage</b>             | no  |  |  |  |  |
| <b>Stained Surfaces</b>    | from rust   |  |  |  |  |
| <b>Comments</b>            | Requires painting   |  |  |  |  |
|                            | A total of 68 thickness measurements were obtained along the shell, roof, and bottom of Tank #78.                                     |  |  |  |  |
|                            | Thickness data exceeded API 653 and NJDEP criteria for AST shell thickness. All data are presented in a schematic diagram of Tank 78. |  |  |  |  |

Hazardous Waste Cas. # 64742-48-a 8'D x 24'H

Cap. 12,000 gal.



RESPONSE TO ALLEGED NOV<sub>s</sub>  
& IRL<sub>s</sub>

ATTACHMENT 15

Copies of RCRA Waste Analyses for Select  
Waste Streams

Elan Chemical Company, Inc.  
Newark, NJ

## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/12/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         | DELIVERY TO LAB |             |
|---------|----------|------|---------|-----------------|-------------|
| LAB No. | DATE     | TIME | SAMPLER | DATE            | TIME MATRIX |
| 67461   | 02/23/99 | 0900 | CLIENT  | 02/23/99        | 1130 SO     |

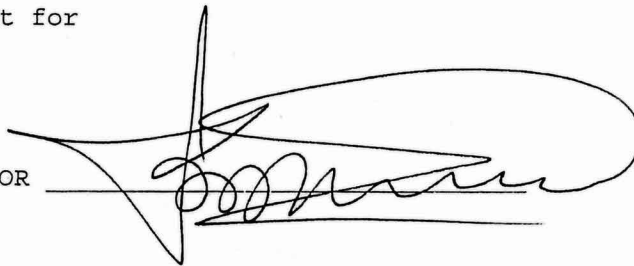
CLIENT STATION ID: EM4677  
LAB #: 67461

| TCLP EXTRACTION (METALS/BNA) |          | COMPLETE |
|------------------------------|----------|----------|
| TCLP SEMI-VOA'S.....         |          | R. A.    |
| TCLP VOA'S.....              |          | R. A.    |
| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure ttest for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR



2/23/99

EMPG Residue

## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/12/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         |
|---------|----------|------|---------|
| LAB No. | DATE     | TIME | SAMPLER |
| 67461   | 02/23/99 | 0900 | CLIENT  |

| DELIVERY TO LAB |             |
|-----------------|-------------|
| DATE            | TIME MATRIX |
| 02/23/99        | 1130 SO     |

CLIENT STATION ID: EM4677  
LAB #: 67461

| TCLP EXTRACTION (METALS/BNA) |          | COMPLETE |
|------------------------------|----------|----------|
| TCLP SEMI-VOA'S              |          | R. A.    |
| TCLP VOA'S                   |          | R. A.    |
| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

The residue sample is below regulatory levels for the Toxicity Characteristic Leaching Procedure test for determination of hazardous waste status.

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR

## REPORT OF ANALYSES

ELAN CHEMICAL  
268 DOREMUS AVENUE  
NEWARK, NJ 07105-  
Attn: JOCELYN MANSHIP

DATE: 03/10/99  
YOUR REF/P.O.: 22457

PROJECT NO. 10855C (Page 1 of 1)

| SAMPLE  |          |      |         | DELIVERY TO LAB |             |
|---------|----------|------|---------|-----------------|-------------|
| LAB No. | DATE     | TIME | SAMPLER | DATE            | TIME MATRIX |
| 67461   | 02/23/99 | 0900 | CLIENT  | 02/23/99        | 1130 SO     |

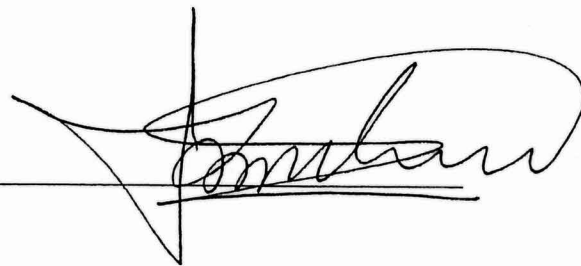
CLIENT STATION ID: EM4677  
LAB #: 67461

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|------------------------------|----------|----------|
| TCLP SEMI-VOA'S.....         |          | R. A.    |
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| TCLP ARSENIC                 | mg/L     | <0.004   |
| TCLP LEAD                    | mg/L     | 0.002    |
| TCLP BARIUM                  | mg/L     | 0.002    |
| TCLP CADMIUM                 | mg/L     | <0.0014  |
| TCLP MERCURY                 | mg/L     | < 0.0002 |
| TCLP SELENIUM                | mg/L     | 0.010    |
| TCLP SILVER                  | mg/L     | <0.002   |
| TCLP CHROMIUM                | mg/L     | <0.002   |
| IGNITIBILITY                 | Degree C | >100     |
| CORROSIVITY                  | pH Unit  | 9.20     |
| SULFIDE-REACTIVITY           | mg/kg    | < 53.0   |
| CYANIDE-REACTIVITY           | mg/Kg    | <1.05    |
| SOLIDS, PERCENT              | %        | 97.88    |

PROJECT NAME: EM4677

NOTE: R. A. = REPORT ATTACHED

LABORATORY DIRECTOR



Contract: ELAN CHEMICAL

Site:

Location:

Group:

Lab Sample ID: O67461

Lab File ID: V5380.D

Date Received: 2/23/99

Date Analyzed: 2/25/99

Dilution Factor: 1.0

Soil Aliquot Volume: (uL)

(ug/L or ug/Kg)

ug/L

Q

CAS No.

Compound

(ug/L or ug/Kg)

ug/L

Q



## TCLP SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EM4677

Lab Name: CHEMTECH

Contract: ELAN CHEMICAL

Project No.: 10855C

Site:

Location:

Group: EM4677

Matrix: (soil/water) WATER

Lab Sample ID: O67461

Sample wt/vol: 100.0 (g/mL ML

Lab File ID: Z03572.D

Level: (low/med)

Date Received: 2/23/99

% Moisture: 100

decanted: (Y/N): N

Date Extracted: 2/25/99

Concentrated Extract Volume: 1000 (uL)

Date Analyzed: 2/26/99

Injection Volume: 2.0 (uL)

Dilution Factor: 1.0

GPC Cleanup: (Y/N) N

pH:

Concentration Units:

(ug/L or ug/Kg)

ug/L

Q

[illegible]

## CHAIN OF CUSTODY RECORD

North Jersey  
110 Route 4  
Englewood, NJ 07631  
(201) 567-6868 Fax (201) 567-1333

South Jersey  
512 Route 9 South  
Forked River, NJ 08731  
(609) 693-2111 Fax (609) 971-9300

CHEMTECH JOB NO.:

CHEMTECH QUOTE NO.:

### CLIENT INFORMATION

REPORT TO BE SENT TO:

COMPANY: ELAN Chemical  
ADDRESS: 268 Doremus Ave  
CITY: Newark STATE: NJ ZIP: 07105  
ATTENTION: Jocelyn KAPLANSHIP  
PHONE: 973 344 8014 FAX: 973 344 1948

### PROJECT INFORMATION

PROJECT NAME: EM4677  
PROJECT NO.: +  
PROJECT MANAGER:  
LOCATION:  
PHONE: FAX:

### BILLING INFORMATION

BILL TO: ELAN Chem PO #: 22457  
ADDRESS: 268 Doremus Ave  
CITY: Newark STATE: NJ ZIP: 07105  
ATTENTION: PHONE:

### ANALYSIS

### DATA TURNAROUND INFORMATION

☐ 21 DAYS ☐ APPROVED BY:  
☐ 14 DAYS  
☐ 7 DAYS  
☐ OTHER

21 DAY TURNAROUND HARDCOPY, EMERGENCY OR RUSH IS FAX DATA UNLESS PREVIOUSLY APPROVED.

### DATA DELIVERABLE INFORMATION

☐ NJ REDUCED ☐ CHEMTECH FORMAT  
☐ NJ CLP ☐ RESULTS ONLY  
☐ USEPA CLP ☐ DISKETTES  
☐ NYS CLP ☐ NYS ASP  
☐ OTHER

1 TELP/VOA  
2 TELP/BDA Metals  
3 TELP/React.  
4  
5  
6  
7  
8  
9 BOD/TSS

| CHEMTECH<br>SAMPLE<br>ID | SAMPLE IDENTIFICATION | SAMPLE<br>MATRIX | SAMPLE<br>TYPE |      | SAMPLE<br>COLLECTION |      | # OF BOTTLES | PRESERVATIVES |   |  |  |   |  |  |  | COMMENTS |                      |
|--------------------------|-----------------------|------------------|----------------|------|----------------------|------|--------------|---------------|---|--|--|---|--|--|--|----------|----------------------|
|                          |                       |                  | COMP           | GRAB | DATE                 | TIME |              |               |   |  |  |   |  |  |  | A - HCl  | B - HNO <sub>3</sub> |
| 1.                       | EM4677                |                  | X              |      | 2/23                 | 9AM  | 2            | 1             | 1 |  |  |   |  |  |  |          |                      |
| 2.                       | M175                  |                  | X              |      | 2/23                 | 8AM  | 1            |               |   |  |  | X |  |  |  |          |                      |
| 3.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |
| 4.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |
| 5.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |
| 6.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |
| 7.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |
| 8.                       |                       |                  |                |      |                      |      |              |               |   |  |  |   |  |  |  |          |                      |

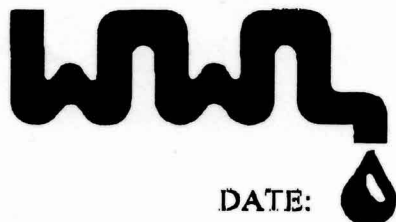
SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

|   |                               |   |   |
|---|-------------------------------|---|---|
| RELINQUISHED BY SAMPLER:<br>1. <u>[Signature]</u> | DATE/TIME:<br><u>2/23 9AM</u> | RECEIVED BY:<br>1. <u>[Signature]</u>         | Conditions of bottles or coolers at receipt: <input type="checkbox"/> Compliant <input type="checkbox"/> Non-Compliant <input type="checkbox"/> Temp. of Cooler <u>5°C</u><br>Comments: |
| RELINQUISHED BY:<br>2. <u>[Signature]</u>         | DATE/TIME:                    | RECEIVED BY:<br>2.                            |   |
| RELINQUISHED BY:<br>3. <u>[Signature]</u>         | DATE/TIME:<br><u>2/23/99</u>  | RECEIVED FOR LAB BY:<br>3. <u>[Signature]</u> |   |

## DATA REPORTING QUALIFIERS - ORGANIC

For reporting results, the following "Results Qualifiers" are used:

- VALUE -** If the result is a value greater than or equal to the detection limit, report the value.
- U -** Indicates the compound was analyzed for, but was not detected. Report the minimum detection limit for the sample with the U, ie "10 U". This is not necessarily the instrument detection limit. The figure represents the minimum detection limit attainable for this particular sample based on any concentration or dilution that may have been required.
- J -** Indicates an estimated value. This flag is used:
- (1) When estimating a concentration for a tentatively identified compound (library search hits, where a 1:1 response is assumed).
  - (2) When the mass spectral data indicated the identification, however the result was less than the specified detection limit but greater than zero. If the detection limit was 10 ug/L and a concentration of 3 ug/L was calculated, report as "3 J".
- B -** Indicates the analyte was found in the blank as well as the sample; report as "12 B".
- E -** Indicates the analyte's concentration exceeds the calibrated range of the GC/MS instrument for that specific analysis.
- D -** This flag identifies all compounds identified in an analysis at a secondary dilution factor.
- P -** This flag is used for a Pesticide/Aroclor target analyte when there is >25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on Form I and flagged with a "P".
- N -** This flag indicates presumptive evidence of a compound. This flag is only used for tentatively identified compounds (TICs), where the identification is based on a mass spectral library search. It is applied to all TIC results. For generic characterization of a TIC, such as chlorinated hydrocarbon, the flag is not used.

**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
(973) 678-3787 FAX (973) 678-8779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: NAT RSTD CASSIA OIL  
SAMPLE NUMBER: 182000

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 6       |
| FLASHPOINT Deg F |     | >180    |

---

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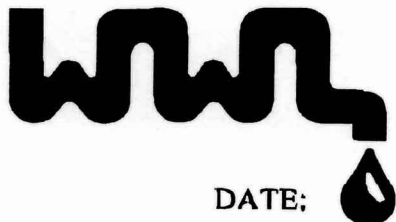
All Results Reported As ppm

MDL = Method Detection Limit

ND = Not Detected Above MDL

NJDEP LABORATORY ID # 07873

W.W.L.'S TOTAL LIABILITY FOR ANY WORK PERFORMED IS LIMITED TO THE COST OF SERVICES RENDERED

**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
(973) 678-3787 FAX (973) 678-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: 1,2 HEXANE DIOL

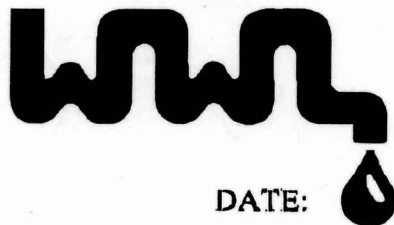
SAMPLE NUMBER: 182001

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 8       |
| FLASHPOINT Deg F |     | >180    |

---

All Results Reported As ppm  
MDL = Method Detection Limit  
ND = Not Detected Above MDL

**W.A.T.E.R. WORKS  
LABORATORY INC.**364 Glenwood Ave., East Orange, NJ 07017  
(973) 678-3787 FAX (973) 678-6779

DATE: JULY 18, 2006

CLIENT: ELAN CHEMICALS

SAMPLE COLLECTED: N/A

SAMPLE RECEIVED: 7/13/06

GENERATOR: ELAN CHEMICALS

CLIENT ID: ETHYL CINNAMATE  
SAMPLE NUMBER: 182002

---

| PARAMETER        | MDL | RESULTS |
|------------------|-----|---------|
| REACTIVE CYANIDE | 2.0 | ND      |
| REACTIVE SULFIDE | 1.5 | 6       |
| FLASHPOINT Deg F |     | >180    |

---

All Results Reported As ppm

MDL = Method Detection Limit

ND = Not Detected Above MDL

NJDEP LABORATORY ID # 07673

W.W.L.'S TOTAL LIABILITY FOR ANY WORK PERFORMED IS LIMITED TO THE COST OF SERVICES RENDERED



268 DOREMUS AVENUE  
NEWARK, NJ 07105  
(973) 344-8014  
FAX (973) 344-1948  
www.elan-chemical.com  
EMAIL sales@elan-chemical.com

July 18, 2006

## pH Analysis of Compound SB

|                              |      |
|------------------------------|------|
| 1,2 Hexanediol residue ..... | 7.65 |
| NRCO residue .....           | 9.40 |

A handwritten signature in cursive script that reads "Robert Fiscina". The signature is written in black ink and is positioned above a horizontal line.

Robert Fiscina  
Quality Control Manager